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LICIT AND ILLICIT: CRITICAL NODES IN THE PRODUCTION AND INTERNATIONAL REGULATION OF OPIATES

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Picture in flyneaf : Hergé, The adventures of Tintin: The Blue Lotus. Moulinsart. p.59

Abstract

This master thesis aims at examining the binary distinction between licit and illicit global production networks of controlled substances. It is hypothesized that licit trade of controlled substances is subject to regulation which prevents diversion from occurring. Most studies focus on illegal trafficking, but rarely on licit trade. When they do, their scope is restricted to a location and one controlled substance, either plant-based or synthetic. No studieshave conducted this from the perspective of global production networks on opiates, the base for many pharmaceutical medicines. I argue that there are junctions in which illicit practices penetrate the licit trade, which are located in what I refer as *critical nodes*. My results show that these critical nodes are part of the global production network, from the cultivation of poppy fields to the consumption of an opiate-based medicine. At a time of questioning supply-chains, the opioid crisis and international drug control regime dissensus, this study aims to address the gap in the existing literature. It does so by analyzing one controlled substance, with eclectic theorizing evaluating international regulation and the possibility of compliance in practice. This study follows a qualitative and inductive methodology completed by additional quantitative data. My findings show that there are critical nodes and for most, they are structural and dependent on their cultural and geographical roots. The efforts made by key actors in critical nodes are considered sufficient both internationally and domestically speaking. Three reasons for this attitude are outlined: 1) that enough is already being done, 2) that in agenda-setting other matters are prioritized, such as the issue of counterfeit medicines – a battle of ideologies and values, i.e., access and availability of medicines – and 3) that more regulations would be difficult to set and implement in the context of a free- trade globalized market.

Keywords: licit, illicit, controlled substances, international regulation, international drug control regime, UNODC, critical nodes, global production networks, opium, opioids, practices, diversion, medicines

Résumé

Ce travail de master vise à examiner la distinction binaire entre la production et marchandisation licite et illicite de substances contrôlées. L'hypothèse est que le commerce licite de substances contrôlées est soumis à une réglementation qui empêche le détournement. Un nombre important d'études portent sur le trafic illicite, mais plus rarement sur le commerce licite. Lorsqu'elles le font, leur portée est limitée à un pays et/ou à une substance contrôlée, qu'elle soit d'origine végétale ou synthétique. Aucune étude n'a analysé la question du point de vue des réseaux mondiaux de production d'opiacés, qui sont à la base de nombreux médicaments pharmaceutiques. Je soutiens qu'il existe des points de jonction où les pratiques illicites pénètrent le commerce licite, que je situe dans ce que j'appelle des *nœuds critiques*. Mes résultats montrent que ces nœuds critiques font partie des réseaux globaux de production, et ce, depuis la culture des champs de pavot à la consommation d'un médicament à base d'opiacés. À l'heure où l'on s'interroge sur les chaînes d'approvisionnement, où la crise des opioïdes cause de nombreux dégâts, ainsi que les revendications qu'ont lieues sur le régime international de contrôle des drogues, on peut considérer que cette étude est actuelle et comble les lacunes de la littérature existante. Cette étude le fait en entreprenant une étude de cas sur une substance contrôlée, tout en maniant diverses théories, évaluantainsi la réglementation internationale et la possibilité de s'y conformer dans la pratique. La méthodologie appliquée est qualitative et inductive avec l'utilisation de données quantitatives. Mes conclusions montrent qu'il existe des nœuds critiques et que, pour la plupart, ils sont structurels et dépendent de leurs racines culturelles et géographiques. Les efforts déployés par les acteurs clés dans les nœuds critiques sontconsidérés comme suffisants tant au niveau international qu'au niveau national. Entre autre, trois raisons peuvent expliquer cette attitude : 1) que l'on en fait déjà assez, 2) que l'on accorde la priorité à d'autres questions lors de la définition à l'agenda - notamment la question des médicaments contrefaits, ayant comme socle une bataille d'idéologies et de valeurs profondes, comme les valeurs sociales et morales de la mise en avant des médicaments, l'accès et la disponibilité des médicaments, et finalement 3) qu'il serait difficile d'établir et de mettre en œuvre davantage de réglementations dans le contexte d'un marché mondialisé de libre-échange.

Mots-clefs: licite, illicite, substances contrôlées, régulation internationale, régime de contrôle international des drogues, UNODC, nœuds critiques, réseaux globaux de production, opium, opioïdes, pratiques, déroutement, médicaments

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INTRODUCTION

At a time of many claims and demands targeted at the current international drug control apparatus, with the evolving relationship to drugs (e.g., the use of *micro dosing* of psilocybin in the Silicon Valley or its use with LSD in PTSD treatment in medical research), and during an opioid crisis in the so-called Global North, it seemed particularly timely to study the supply chain of substances.

Moreover, in the era of a global pandemic, these questions were especially relevant, with the minimum stock of essential goods and the dependence of states on globalized trade, for example. With current dysfunctions between states, as shown in the recent relations between China and the U.S., debates on the supply of raw material raising issues on national sovereignty of goods considered essential is striking.

The interest here is not to discuss all kinds of substances, but rather focus on controlled ones. This implies control by a legal framework under UN conventions and implemented with variations, at the national levels of all signatory parties. Such substances are interesting as they bear a double status. They are crucial in health care as medicines but have another life in illicit use in the black market. Drugs bear this essential ambivalence, they are a remedy in small doses and suitable therapeutic application, but also a poison if the dose is not appropriate and used non-medically.

It is in these terms that I wished to examine the seemingly binary distinct markets – licit and illicit – and question whether there are any junctions in the licit industry that feeds the illicit market. These categories are the result of a social construct, and when looking at the international drug control regime, official reports and its main players, it seems that both markets exist and function differently and do not interact with each other.

My key assumption was that even if controlled, the licit industry must have a proportion of diversion hidden in its structural globalized organization. In other words, the current licit industry of controlled substances has biases in compliance terms, and the aim was to highlight what the biases are, where they are found, and how they are managed and regulated at the international level.

In order to do so, I had to narrow down my research object and focus on a case study. I therefore chose opiates as one controlled substance. The reason behind this choice can be explained by the historical ties to this plant-based substance and its blatant double use (when transformed, one obtains heroin), and its many derivatives used widely in the health sector. My main research question was therefore: what are the critical nodes in the global production network of opiates in which *licit* and *illicit* can become indistinguishable categories? In order to respond to this question, I chose to study how it functions today, with a socio-historical perspective. My objective was to understand its globalized organization, and with that in mind, using the global production network approach seemed adequate. Such a perspective allowed me to visualize the logic, relationships, and logistics of the businesses in accordance with international regulations and question their compliance throughout the networks.

This study is novel in its approach and research design. Indeed, a vast body of literature exists on the illegal market and production; many studies have focused on its functioning, crop reduction or replacement programs, and on the UN international

control regime itself (concentrated in “illegal producers” such as Afghanistan or Mexico), but almost none have examined it through the lens of global trade and diversion of licit production.

Diversion is a technical word to describe the rerouting of the licit commerce, from its production to its consumption. Instead of studying a particular country, as others have done (for example India or Tasmania), Iwished to examine diversion through the globalized trade perspective. This means that I deconstructed how the industry works, from the poppy fields to the consumption of medicines, in order to identify critical nodes. By doing so, I addressed the existing gap in the literature by outlining the global production network of licit opiates, while questioning how the international regulations can co-exist and comply with this specific market.

This research was inductive and investigative. It was inductive as I had to build theory from observation and analysis. It was investigative, as this industry is particularly complex and opaque, and therefore meaning I had to clarify the terms and enter the techno-expert sphere in order to study it. While exploring the research topic with a global production network perspective, I wanted to understand the role of the UNODC, the main UN organization whose mandate concerns drugs and crime, in the regulation of such critical nodes.

My findings show that critical nodes are to be found throughout the global production network. They are various and diverse depending on the geographical position, cultures, histories, values, laws and implementation of international regulations and practices. These critical nodes are not organized by transnational organized crime; they rather behave simultaneously and can be organized albeit in a small scale. They are the expression of the multiple independent illicit practices which have become a social fact. I have outlined them in this research in away that also breaks down how the industry functions.

Regarding the role of the UNODC, I have found that although from the outside it may seem they play an important role, this is notthe case for various reasons. The UNODC focuses mostly on illegalissues: it is an organization that collaborates broadly with other agencies on transnational crime, produces reports and provides spaces for discussions, and holds the Commission on Narcotic Drugs (CND). The CND is particularly important as it is withing the sessions that the current status of regulated drugs in the scheduling system is evaluated and voted.

Rather than the UNODC, the International Narcotics Control Board in Vienna (INCB) is the right organ to address my topic. Self-described as "independent, quasi-judicial expert body" (INCB, 2020), they assist governments in the implementation of the Single Convention of 1961. They ensure the supply of drugs for medicine and scientific research, produce estimates and reports, assess the chemicals used in the illicit manufacture, analyze information provided by agencies and governments and make recommendations to governments in the management of the obligations of the treaties (mainly Single Convention of 1961 and Psychotropic Substances of 1971). While I initially believed that more actions were undertaken in order to avoid diversion, my research findings provide results that what prevails is a riskassessment thinking. As I will demonstrate, depending on the ideological background and their agenda-setting, the matters to dealwith are prioritized differently. For instance, in the case of medicines, the most important matter is availability and access to medicines (the existence of an essential medicine list by the WHO illustrates this point) while fighting counterfeit medicines implies many side-effects, deaths for patients, and loss of profit and reputational costs to pharmaceutical industries.

In order to examine my research questions, this master thesis will cover, in this order, the following parts: the first chapter will outline the conceptual framework with the literature review. The second chapter will present my questions, hypotheses, methodology applied. The third chapter is an evaluative description of the institutionalization of the international drug control regime from its beginnings until its current regime. The fourth chapter examines opioids as a broad category and the questions it raises. The fifth chapter explores the critical nodes in the global production networks and the role of the UNODC. Let us now follow with the theoretical framework.

CHAPTER I. THEORETICAL FRAMEWORK AND LITERATURE REVIEW

The research object

My initial concern started while questioning how the international regulation of drugs could prevent illicit channels without blocking access to medicines used from the same substances. The double status of a number of drugs is indeed striking. On the one hand, they can be viewed as a commodity for the public good, providing access – and the right to - medical treatment. On the other hand, they are based on substances with psychotropic attributes that feed addiction and are likely to be diverted into illegal markets causing harm, with moral, societal, health, economic and security implications. This prompts me to ask how a *controlled substance* used in both medicine and illegal drug markets is regulated at the international level.

Controlled substances – or controlled drugs – have been internationally regulated by treaties since the UN Single Convention on Narcotic Drugs in 1961, its protocol amended in 1972, the UN Convention on Psychotropic Substances in 1971, and the UN Convention Against Illicit Traffic in Narcotic Drugs and Psychotropic Substances in 1988. These conventions make up what

I will refer to here as the International Drug Control Regime[1] (Global Commission on Drug Policy, 2018; Global Commission on Drug Policy 2019; Chouvy 2012). Signatory Parties endorsed national laws either prior, concomitantly or after the institutionalization of such conventions. On the Drug Enforcement Agency (DEA)'s website, the agency defines controlled substances as "drugs or chemical whose manufacture, possession, or use are regulated." As a common characteristic, controlled substances are both useful in the treatment of human disease, but also tend to be diverted, recreationally abused, illegally produced and/or smuggled. They represent a significant public health hazard in relation tounderlying patient-safety issues and criminal behavior (Tribble, 2016).

It is worth noting that, on a strictly semantic basis, theEnglish word *drug* betrays the ambivalence outlined above.[2] Such contradictions are inherent and contextual. The Greek roots of pharmacology come from *pharmakon*, which means "cure" as well as "poison" (Urboniene, 2009). Such opposites are frequent in Greek philosophy. Derrida, in exploring Plato's Pharmacy, adds layers to this understanding (Derrida, 1972). According to him, *pharmakon* is interconnected with *pharmakon* as a remedy, *pharmakeus* as druggist/alchemist/magician, and in ancient Greece, *pharmakos* representing the sacrifice ritual, relating to the scapegoat – which is present in the Bible as well. Such background knowledge helps to retain a critical stance on the highly morally charged issues of drugs in international relations as well as in other social spheres.

[1]United Nations Treaties on the International Drug Control, New York, 2013: https://www.unodc.org/unodc/en/commissions/CND/conventions.html accessed September 14th, 2020.

[2] In French, two separate words denote the ambivalence: *médicament* is understood as remedy, and legal. However, in the field of medicine it is widely accepted that it has the potential to be poisonous. The second word is *drogue* which connotes poison, as an abusive practice, and in illegality. A drogue can under no circumstances be a *médicament*. In French, therefore, there are two words for the two sides of the coin. In English, it is more nuanced as drug refers to kinds of medicines but can also connote illicit, in which case the words co-occur: illicit drug. However, for other kind of medication, medicine is preferred, and has a remedy connotation.

Drugs are polymorphic in nature, and this has always been the case given the contingent socio-historical context within which they have been institutionalized. This is where the licit and illicit come into play, with the distinction between the two arising first from a legal understanding. Licit means what is allowed by law, conforming to the requirements of the law, of an authority, or by usages.[3] In contrast, illicit is defined as not permitted, unlawful, illegal, disapproved of by the normal rules of society, condemned by moral.[4] However, what is lawful or unlawful at a given time is mutable and socially constructed.

From a sociological perspective, Durkheim mentioned that: "punishment is meant to affect honest people, not criminals, and we do not condemn an act because it is criminal, but it is criminal because we condemn it"[5] (in Normandeau, 1970). The issue of drugs is quite similar. Whereas a dichotomist view on what is legal, and illegal might be straightforward, when it comes to practice it is much more nuanced. As Durkheim's quote expresses, what is lawful or unlawful today is the fruit of a social construct. As for other sociologists and anthropologists who worked on deviance (e.g., Becker or Goffman), this assumption comes as no surprise. The interest of sociologists is to understand the use of drugs. Following work on deviance, Enrich Goode suggests a typology of four main forms of drug use in the licit/illicit spectrum which helps in

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[3] Definition of licit: https://dictionary.cambridge.org/dictionary/english/licit: allowed by law ; https://www.oxfordlearnersdictionaries.com/definition/english/licit: allowed or legal. https://www.merriam-webster.com/dictionary/licit :conforming to the requirements of thelaw; not forbidden by law: permissible. Accessed September 15th, 2020. https://www.cnrtl.fr/definition/licite: [En parlant d'une chose] qui est permis par la loi, parune autorité, par les usages ; qu'aucune loi ne défend. Accessed September 15th, 2020.

[4] Definition of illicit: https://www.merriam-webster.com/dictionary/illicit : not permitted; unlawful.
https://dictionary.cambridge.org/dictionary/english/illicit : illegal or disapproved of by society.
https://www.oxfordlearnersdictionaries.com/definition/english/illicit : not allowed by the law; not approved of by the normal rules of society. https://www.cnrtl.fr/definition/illicite En parlant d'un inanimé - Qui est condamné par la loi et/ou par la morale. Accessed September 15th, 2020.

[5] My translation. The original text is in French: « Le châtiment est destiné à agir sur les honnêtes gens, non sur les criminels, et nous ne réprouvons pas un acte parce qu'il est criminel, mais il est criminel parce que nous le réprouvons. »

nuancing the understanding of drugs.[6] This is only one example of a typology, of many, that highlights that there is no such thing as black or white when studying a social object. Social science methodologies, such as ethnographies, surveys, interviews and most importantly, field work are used in this area.

Laws exist to define boundaries, to work to protect and preserve rights; in democracies, they are proposed and voted by Parliaments, and sometimes endorsed by Governments or citizens. Regulations, however, are issued by independent or dependent agencies and tend to regulate activities, irrespective of rights. They are used to carry out or maintain specificities in the intent of the broader scope of a law.

In positivist legal science, law is considered pragmatic and also descriptive in the sense that it is interested in human beings at a given time; and it is prescriptive, in the sense that it legislates in function of what can reasonably be expected from human beings.[7] In other words, what is licit today, may not be licit tomorrow, and vice-versa. It is through social construction that a legal and/or a moral status is applied. In the case of international law, it has a specific purpose:

> *"[it] provides normative guidelines as well as methods, mechanisms, and a common conceptual language to international actors […]. International law is an independent system of law existing outside the legal orders of particular states. It differs from domestic legal systems in a number of respects. For example, although the United Nations (UN) General Assembly, which consists of representatives of some*

[6] He distinguishes between: "1) legal instrumental use: prescription and over-the-counter medicines to address physical and mental ailments ; 2) legal recreational use: consumption of alcohol, tobacco, and caffeine for their pleasurable effects ; 3) illegal instrumental use: using medicines without a prescription, such as anti-depressants and stimulants, to address pain or undertake tasks such as staying awake to cram for exams, and ; 4) illegal recreational use: drugs consumed for their pleasurable, euphoric, and intoxicating effects." (Goode, 2012 in Freij & Germov, 2015).

[7] For the interested reader, see the article on the adequation of the Sein and Sollen in Law: Ladavac, N. B. (2019). Sein and Sollen, "Is" and "Ought" and the Problem of Normativity in Hans Kelsen. In: Ladavac N. B., Bezemek C., Schauer F. (eds) The Normative Force of the Factual. Law and Philosophy Library, vol 130. Springer, Cham.

> *190 countries has the outward appearance of a legislature, it has no power to issue binding laws. Rather, its resolutions serve [mostly] as recommendations […]. Also, there is no system of courts with comprehensive jurisdiction in international law. […] This value consists in the certainty, predictability, and sense of commonpurpose in international affairs that derivesfrom the existence of a set of rules accepted by all international actors. International law also provides a framework and a set of procedures for international interaction, as well as a common set of concepts for understanding it." (Shaw, 2019).*

Abbott and Snidal (2000) believe that international governance refers to *soft law* as compared to *hard law* as they are no legally binding obligations but remain powerful and effective norms.[8] In this work I follow the latter, and the following Abbott, Keohane and Moravcsik's understanding of legalization, i.e., "as a particular form of institutionalization characterized by three components: obligation, precision, and delegation." [9]

What distinguishes international relations from a *stricto sensu* international law perspective is the subject of inquiry. From the perspective of an international relations student, this thesis considers the relationships between actors while studying the norms underlying them. A formal international law standpoint would only be interested in the norms that govern relationships between states, and their transactions. One might here refer to the difference

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[8] Rather than using "global governance" without any distancing – I agree with Susan Strange's "semantic euphemism" and believe that "intergovernmental bureaucracy's decision-making power set by the most powerful government" express better the reality of international cooperation (Strange, 1990: xiv).

[9] ""Legalization" refers to a particular set of characteristics that institutions may (or may not) possess. These characteristics are defined along three dimensions: obligation, precision, and delegation. Obligation means that states or other actors are bound by a rule or commitment or by a set of rules or commitments. Specifically, it means that they are legally bound by a rule or commitment in the sense that their behaviour thereunder is subject to scrutiny under the general rules, procedures, and discourse of international law, and often of domestic law as well. Precision means that rules unambiguously define the conduct they require, authorize, or proscribe. Delegation means that third parties have been granted authority to implement, interpret, and apply the rules; to resolve disputes; and (possibly) to make further rules." (Abbott, Keohane, Moravcsik, 2000: 2).

between "realism and idealism, what actually is done and what ought to be done by states" (Keohane, 1997). Notwithstanding, international law has its importance in the context of national laws. Analyzing how they each interconnect is an important matter.

Moreover, from a *regime* perspective (Krasner, 1983 in Keeley, 1990) the international drug control apparatus applies to Krasner's regime definition – and this is why I speak of the international drug control regime:

> *"implicit or explicit principles, norms, rules, and decision-making procedures around which actors' expectations converge in a given area of international relations. Principles are beliefs of fact, causation, and rectitude. Norms are standards of behavior defined in terms of rights and obligations. Rules are specific prescriptions for action. Decision-making procedures are prevailing practices for making and implementing collective choice." (Krasner, 1983:2).*

Nadelmann (1990) explores different types of "international prohibition regimes" and puts forward crucial elements to their founding, their *raison d'être,* and their survival motives. However, he also outlines similarities of various regimes (for example, human trafficking and drug substances) and explains why – as a realist would ask itself– in a state of anarchy, states would make international laws (Wendt; Friedheim, 1995) and continues with the question of a liberal institutionalist - why states would be better off. The common denominator attributed is often, in a globalized world in which complex interaction and interdependence among states should bring more cooperation between states (Keohane; Nye, 1973).[10]

While such approaches believe in a certain rational choice, there is an element of social constructivism, and some limited

[10] I will not define "globalization" in this work as I agree with Susan Strange on this question that it is a "term which can refer to anything from internet to a hamburger." (Strange, 1996: xiii).

rationality that has to be admitted when deciding upon treaties. This does not imply that they have full knowledge or understanding, rather, that they rationally decide to create an international prohibition regime. Indeed, states realize their own limitations in terms of the "inadequacy of unilateral and bilateral law enforcement measures in the face of criminal activities that transcend national borders" (Nadelmann, 1990). Crucially, "in explaining why [only] certain criminal laws evolve in international prohibition regime is the role of moral proselytism", Nadelmann, when referring to actors taking part in moral proselytism talks about "transnational moral entrepreneurs"[11]; a term that applies rightly in the case of opium. As we will see in the contextualization section below, transnational moral entrepreneurs of different sorts were decisive in the current drug control regime.[12] In addition to the regime, the influence of transnational moral entrepreneurs, and events throughout history, I note the hegemony which the US held, and still hold to a certain degree, in the instauration and stability of the current system in the drug control apparatus. Although today there is profound criticism of this apparatus, it is still supported by conservative states (for instance in the Middle East or in Asian regions).

[11] As he mentions in his article p.482 in a footnote: "transnational moral entrepreneurs" is inspired by the work of Becker on deviance, "moral entrepreneurs": "those who operate with an absolute ethic in seeking to create new rules to do away with the perceived great evil" (Becker, 1963: 148) ; and Huntington's notion of "transnational organization": relatively large, hierarchically organized, centrally directed bureaucracy... [that] performs a set of relatively limited, specialized, and in some sense, technical functions . . . across one or more international boundaries and, insofar as it is possible, in relative disregard of those boundaries" (Huntington, 1973: 333).

[12] Nadelmann (:482) describes transnational moral entrepreneurs as follows: "these groups mobilize popular opinion and political support both within their host country and abroad; they stimulate and assist in the creation of like-minded organizations in other countries; and they play a significant role in elevating their objective beyond its identification with the national interests of their government. Indeed, their efforts are often directed toward persuading foreign audiences, especially foreign elites, that a particular prohibition regime reflects a widely shared or even universal moral sense, rather than the peculiar moral code of one society. Although the activities that they condemn do not always transcend national borders, those which do go beyond borders provide the proselytizers with the transnational hook typically required to provoke and justify international intervention in the internal affairs of other states." Although not necessarily organized as above, persona who came together through their ideals were essential in the drug control regime. One can think of Harry Anslinger and Hamilton Wright in the U.S. or Colonel Charles Ludovic Sharman in Canada, among others.

However, more countries and regions have adapted their approach, mostly in an effort towards depenalization. Such endeavors have been historically disapproved by fervent prohibitionist parties. Civil society has been at the front line of this battle, calling for research-based policies and socio-medical approaches, both of which would bring better security perspectives as a whole. Security here encompasses human, societal, and crime- and violence-related security. Many advocates, including parts of international consortiums, NGOs, and the health sector have championed - for many good reasons – a change of strategy. Public policy literature explores past, current and future regulations, assesses them and recommends variations on the public policies.

Critical public policy on this topic has been opposed to the current prohibitionist regime in place. I will mentiona few of the usual reasons stated. Firstly, policies are heavily supply- oriented even today - although huge progress has been made in thatdirection- and have focused on where the drug came from instead of the demand. Secondly, the current system, since its establishment, has been based upon principles of criminality and penalization, thus particularly demonizing drug users and drugs, and this was traditionally targeted to certain social and/or racial minorities, rather than on what the drug itself could cause (Speaker, 2001; Reinarman and Levine, 1997).

Further, the system has not adequately addressed the many issues of interdependence such as those between illicit drug markets and consumption. This could create a "balloon effect" whereby squeezing the trade in one area would lead it to relocate (Ashton, 2002 in Buxton, 2006: 101). Indeed, another important criticism is that there are not enough research-based and evidence-based policies; most are politically driven. Politics around the control regime was used to gain political advantages in governments in the 1960s and 1970s, infused with the propaganda and fear statements of the "stepping-stone" theory: from marijuana to heroin (Buxton, 2006: 61). While prisons are filled with mostly petty criminals,

usually low users and from low social status, even imprisonment has been questioned due to the high-level rates of recidivism. Notenough is done on the demand-side, and policies must adequately reflect multiple realities rather than bear ideologies. The policies inplace are perceived as too unfair and inequitable, and even though the current control system has brought some good things, there is not enough cooperation between states, even though drugs and their misuse have been recognized as a transnational problem.

In my research, I focus specifically on one substance and its derivative: opium. Within opium lays many active pharmaceutical ingredients that are used in many medicines, but also the source of many illicit uses. The existing extensive literature on opium has been explored through various lenses in multiple fields. I adopt a non-exhaustive perspective applied to both licit as well as illicit opium. It is studied by the medical field studies for its effects on the mind and body, its uses in treatments and also in harm reduction and dependence, mostly demand oriented. Pharmacologists and chemists, whose research constitute a specialized body of literature, focus on the potency of the substances, technologies for synthesizing them, drug manufacture and opium precursors. The pharmaceutical industry also produces literature, directed at drug creation, manufacture, control, prevention, and research and development. For this thesis, I have also reviewed literature from a logistics and economic perspective, on the global supply chain of medicines, and on plant-based medicine, which will be more fully addressed in the industry section.

Opium interested many historians and geographers for its rich background rooted in history and histories, territories and cultural aspects but also its institutionalization. Development studies, whether with historians and geographers, or sociologists and economists, have focused on inequalities, poverty, north/south relations, access to medicine and counterfeit, but also nexuses with illegal activities, poverty and violence. They also question different aspects for instance in development projects put forward for crop

reduction, they advocate that such projects are not well thought out, leaving too fundamental considerations aside (such as the gain benefit for a farmer to cultivating for illegal sources instead of legal ones) or changes in technologies used for cultivation and production (such as the traditional harvest of opium poppies *versus* the CPS method – which is more cost-effective and less prone to diversion), or even the exploitation of peripheries from centers in terms of the salary farmers receives compared to the price of medicines then sold. Development studies and post-colonial literature have pinpointed the so-called "traditional production countries" or illegal production such as the well-documented narco-state Afghanistan along with the Golden Triangle (Thailand, Laos, Myanmar) and Golden Crescent (Afghanistan, Iran, Pakistan), known for their illegal trafficking.

Political science and international relations have largely examined opium through processes and negotiations of public policies, international regulation, the political economy of narcotics, the commodity of such substances in an economy, co-dependence with illicit activities, and through vast research on the illegality of opium. Indeed, illegality, trafficking, clandestine manufacture, transnational organized crime (TOC), have all been extensively studied by scholars, international organizations and law enforcement.

The diverse aspects of opium are studied in different ways by the various actors. For instance, international organizations in general, civil society, and medical fields will study the right to access medicine, counterfeiting, and diversion practices. Other international organizations and political and economic sciences will question illegal trafficking, violence, crime, poverty, trade, corruption, as dependent variables of this substance.[13] Their research

[13] I invite you to read the work on Cox (2002) *the covert world*. It provides interesting insights on illegal and legal markets. But as a matter of comparing the illegal market and the legal one, important nuances must be made. In a workshop attended in 2019, Daudelin and Jones (unpublished) presented their potential research article on this specific questions. Some points should be restated here: 1) The defining feature of illegal markets is either that what is traded on them is prohibited, or that legal goods are traded on such markets in violation of state regulations. 2) illegal markets exist at once because and in spite of state

and findings are mostly focused on supply rather than on demand. They are all usually region-based, use a methodology and theory or concepts, and have a normative trait, given the intensity of the moral aspect in this area. Finally, public opinion produces discourse and research as well, but mostly on the opioid crisis and the role of pharmaceutical industries. Another point I should make here is that there have been studies on the international drug control regime mandated to experts by governments. For example, the health department in the U.K. commissioned David Mansfield (2001) for reports on the current situation (with licit and illicit activities and countries), or the FOPH in Switzerland recently asked Groupement Romand d'Etudes des Addictions (GREA) on the current system of control, future scenarios with other adequate indicators.[14] Though there has been extensive literature covering the many facets of the theme and topic, I did not find any research which aimed to respond to the same questions I ask myself here, nor with the theoretical approach I have come together that I would like to mobilize. So, let us explore the conceptual framework now.

Conceptual approach

When discussing licit and illicit activities, it is important to bear in mind the stance of specific literature from international political economy (IPE) sometimes coined as illicit international political economy (IIPE) (Andreas, 2004). Authors such as Nadelmann (1990), Friman and Andreas (1999), Williams (2003), and Strange (1996) and Naylor (2005) studied these aspects. As Andreas clarifies, IPE "is conventionally defined as the relationship between states and international markets, [whereas] IIPE can be

action: without state regulation, those markets would be legal and would cease to exist as illegal markets, but with effective enforcement of state regulations, they would not exist either. 3) They exist and function at least to some extent in the cracks and nooks of state rules and their enforcement. Another point is, market wise, the price of a commodity good is typically determined as a function of its market as a whole whereas in case of illicit good it depends on the level of risk. This above can well be applied for the topic studied here.

[14] https://www.grea.ch/sondage-sur-le-systeme-international-de-controle-des-drogues accessed October 17th, 2020.

defined as the relationship between states and illegal international markets. Through its monopoly on the power to criminalize certain economic sectors, the state defines the boundaries of illegal market activities." (Andreas, 2004). This is particularly important as I aim to study the relationships between the international regulation of the international drug control regime (made by states) and the international market of opiates and examine the critical nodes of such international markets bounded with illegal market activities. Andreas notes that sometimes it is better to "engage in eclectic theorizing, combining insights from various theoretical traditions."[15] For the purpose of this work, this is exactly what I do. I have thus created my own conceptual framework to study the topic, as embracing onlyone perspective would seem to provide an unnecessarily narrow understanding of my research questions.

In light of eclectic theorizing, inspiration from the Global Production Network studies seemed an interesting lens from which to begin.[16] It is partially applied in my research and aims at reviewing

[15] Andreas (2004: 645): "The utility of multiple theoretical perspectives can be illustrated in the case of illegal drugs and anti-drug policies. For example, sharp variations in state responses to global drug trafficking (contrast, for example, the highly punitive US approach to the more public health approach of many west European states) cannot be explained without incorporating the role of culture (stressed by social constructivists). The creation and maintenance of a global drug prohibition regime cannot be explained without taking into account the backing of the most powerful states in the international system (stressed by realists), but also cannot be explained without recognizing the role of nonstate actors, including organized societal groups of 'transnational moral entrepreneurs' (stressed by both liberals and constructivists) (Nadelmann, 1990). The fact that some poor countries depend on illegal drug exports to generate foreign exchange and employment can be seen as part of the broader historical pattern of dependence on 'boom and bust' primary export commodities (stressed by Marxists and other radicals in the dependency theory tradition). Viewed from the economic perspective of comparative advantage (as stressed by neoliberal economics), such reliance on illegal drug crops can be interpreted as rational specialization based on a country's competitiveness in a global market niche (thus, Afghan poppy growers and Bolivian coca farmers are, in a sense, taking the advice of western liberal economic advisors literally by growing high-demand export crops in which they have a competitive advantage and that offers them the highest international market returns)."

[16] I follow the distinction from Yeung and Coe (2015, 2019). Global Production Network (with capital letters) refers to the study in general, whereas global production network(s) refers to the empirical phenomenon. It seems important to briefly outline the roots of Global production network by explaining the Global Commodity Chain (GCC) and Global Value Chain (GVC). The GCC framework originates World-System Theory (Wallerstein, 1974, Arrighi and Drangel, 1986). A commodity chain was defined as: "a network of labour and production processes whose end result is a finished commodity" (Hopkins and Wallerstein, 1986) and was later paradigmatized in Gereffi and Korzeniewicz's (1994) famous work: *Commodity Chains and Global Capitalism*. GCC aims to "examining forms of economic interactions and power relations between (mostly northern) 'lead' firms and their suppliers. […] its objective is to understand and facilitate (mostly southern) supplier firm 'upgrading', which in turn is held to contribute to regional development. This 'north–south' element

international regulations in the context of the global network of actors involved in the production and regulation of controlled substances.

Global production networks, in their empiricism, are "organizational platforms through which actors in different regional and national economies compete and cooperate for a greater share of value creation, transformation, and capture through geographically dispersed economic activity." (Yeung; Coe, 2015). These specificities are structural variables. Such an approach is actor-oriented and focuses on organizational relationships. Adopting this perspective makes it possible to explain "how these globalization processes [in the context of outlining the manufacture and distribution of opioid alkaloids and analyzing diversion] are actually organized".

A global production network is defined by key authors in this area as: "an organizational arrangement comprising interconnected economic and noneconomic actors coordinated by a global lead firm and producing goods or services across multiple geographic locations for worldwide markets." (Yeung; Coe, 2015). For the sake of this master thesis, the global production network of opium is considered to describe a global multiscalar network of licit and illicit economic and noneconomic actors, through licit and/or illicit practices, behaviors, sometimes coordinated, but from which actors are implicated in the specific industry.

Given the globalized nature of the pharmaceutical industry, adopting such an approach allows one to visualize – without

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provides the framework with the potential for understanding processes of global uneven development. […] but GCC analysis is concerned above all with poor country firms' ability to upgrade." (Selwyn, 2015) GVC is somehow the developments of the GCC, while it bears today fundamental distinctions for each stand. Their commonalities are: "(1) how a global commodity/value chain is organized, and who the most powerful players are driving the chain ("lead firms"); (2) how the way the chain is governed ("governance structure") affects the distribution of gains across chain participants, that is, countries, firms, and workers in developed and developing countries; and (3) what determines the movement of chain actors from low to high value-added activities ("upgrading"). In methodology, both approaches focus on a firm-level chain analysis with data gathered from fieldwork." (Lee, 2010). It is worth noting that "there are some inevitable incursions into GVC conceptual terminology and territory given the overlaps between the fields and the shared sensibilities of some aspects of the GVC research agenda" (Coe and Yeung, 2019).

analyzing one specific country or global lead firm in-depth–the location within key parts of the supply-chain of key actors worldwide, from the production to the commercialization of a controlled plant-based drug. Therefore, as a first research question I will address the following: What are the *critical nodes* in the *global production network* in which the *licit* and *illicit* aspects of a substance can lose their distinguishable categories? This framing is constructed solely to outline critical moments in which controlled substances can be unmonitored and diverted. The thesis argues that diversion can happen – more frequently than seems to be admitted – at any stage of licit trade, and in particular for the case of this commodity: opiates. While arguing that diversion happens, which may be considered novel, I attempt to illustrate the supposition of specific junctions in which licit and illicit should not be binary categories but taken as a whole network.

Although actors and practices definitely have their importance in diversion, there are also systemic structural justifications that can explain what is – or is not – done about those junctures. As outlined by Mansfield with regard to opiate raw material (also called narcotic raw material - NRM) from which the opiate alkaloids are extracted, "[A]s such, there would seem to be a growing conflict between the highly regulated and controlled nature of the market for the supply of opiate raw materials, and the increasingly *laisser-faire* model for their purchase on the international market" (Mansfield, 2001: 9). In an economic context giving prominence to *laissez-faire* and free trade, the regulation of commodities defined as controlled substances can easily become fraught with difficulties.

These difficulties can arise from different grounds. As mentioned by Mansfield, one can explain a certain paradox of the phenomenon of enquiry. Controlled substances represent a willingness to regulate and monitor within a *laissez-faire* and free trade environment. In other words, there are discrepancies in the founding of such regulation systems. In addition, due to the success

of some kinds of framing over others – whether in particular ways, through paradigmatic battles, either at the time of implementation or over time – specific measures linked to certain ideologies are ultimately preferred. This is the case for the international drugcontrol regime. Indeed, its institutionalization, as we will see in moredetail in the contextualization section below, was initiated and proactively pursued by the United States, based upon prohibitionist ideals.

Furthermore, the global division of labor, overtly present in all sectors, is another structural variable and a result of globalization to bear in mind. The global organization is multifactorial, but often arises from the industrial specialization of a country. This organization can be explained after having taken into account a cost-benefits analysis. Factually, as admitted generally, any rational human being would seek a Pareto optimal. Similarly, for any globalized commodity, each step usually involves different actors taking part in the manufacturing process and generally spread out throughout the world, until the end-product is considered finished (here, when consumed). In terms of logistics, such global management can also be the foundation of diversion practices and links of licit-illicit channels as particular regulations and laws justify certain practices (Rodrigue, 2020).

One example of global organization of trade in the anti-money laundering processes as part of the Financial Enforcement Network (FinCEN), could be for example the principle used mostly in finance service but also in my topic: “Know Your Customer” (KYC).[17] This principle tries to articulate domestic and international business to make it more transparent and provide due diligence. Although principles or code of conduct are in place, it is important to remember that adopting a realist perspective in international trade makes sense, and what ultimately matters for states is in essence what

[17] Should you be interested in reading more about “KYC” see an article that explains it: https://corpgov.law.harvard.edu/2016/02/07/fincen-know-your-customer-requirements/ accessed October 20th, 2020.

happens on their national soil, and the guarantees they can provide on the land for which they are responsible. To my knowledge, never a legally binding treaty with sanctions has been put in place forthe international community to be held responsible for a commodity.It is often left for each participating party to have its part completedand controlled.

Global Production Network studies take into account that "rather than emphasizing North-South oriented production networks, contemporary polycentric trade involves overlapping, multiple production networks oriented towards different end markets –across both global North and South."[18] This framework emphasizes the relations such actors have, and the division of labor, in the context of diversion. Consequently, as outlined in Global Production Network studies, bottleneck moments in which value is created, captured and transformed, can make sense for my topic. Since specific junctures of the global production network are crucial for production, one may ask whether it is also in such junctions that diversion occurs, and therefore, licit-illicit categories blur.

The main assumption when exploring diversion is that, depending on the geographies, the sense of risk and its assessment arising from diversion, is felt and dealt differently according to domestic circumstances. For instance, in the US, the opioid crisis has brought to light many concerns, and implicated actions in the health sector. Indeed, one fact was the diversion taking place in the health sector in order to feed dependence cravings. It is hard to deny the supplying and the diversion that currently takes place in the US (Titan Group DEA, personal communication, October 7th, 2020). Yet it is not only a question of locations, but of motives and of culture to which we belong. To illustrate the latter, after an exploratory interview with a senior representative at a pharmaceutical

18 https://www.gdi.manchester.ac.uk/research/groups/gpn-trade-labour/ accessed October20th, 2020.

multinational company, its former head of the quality andcompliance section, said to me that diversion from pharmaceutical industries (compared to state-owned enterprises), seldom happens, tothe degree that it would be similar to "imagining a pharmacy hold- up". To sum up, he explained that although they take it into accountin their risk analysis, it does not happen (Anonymous, personal communication, July 2020).

However, contemporary history has proven otherwise, as diversion can arise much more than initially admitted. Although other innocent but somehow *free-rider* (Ostrom, 1990) beings can be involved in diversion and wreaking of crops, they are stoned-Tasmanian wallabies[19], opium-hooked Indian Parrots[20] and Indian dozing monkeys.[21] However, in my belief, drugs are polymorphous, and so is diversion. I will consider that different human beings and factors do take part in different kinds of diversion, throughout the supply-chain.

Some research has focused on applying the Global Production Network approach to the manufacture of medicinal plants, while addressing the illicit practices taking place, through a developmental perspective, or the study of the pharmaceutical industry in India, for example (Pauls; Franz, 2013; Horner, 2014; Horner; Murphy, 2018). However, these papers focus primarily on a geographical development perspective, and outline different results, as their analysis unit is primarily domestic. In this analysis, the global production network is understood in its empiricism to examine the critical nodes more specifically.

What is meant by "critical nodes", comes again, from a variety of inspirations. Firstly, after reviewing articles, in the global

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19 https://www.dailymail.co.uk/news/article-1195417/Stoned-opium-munching-wallabies-create-crop-circles-crashing-poppy-fields.html accessed October 21st, 2020.

20 https://www.independent.co.uk/news/world/asia/parrots-opium-addicted-india-eating-crops-parakeets-birds-a8803396.html accessed October 21st, 2020.

21 http://news.bbc.co.uk/2/hi/south_asia/7509059.stm accessed October 21st, 2020. For other amusing stories on the use of opium, other animals such as water buffalos in South East Asia have been known to use it for leisure, or the use of bees for their chemical attraction to opium poppies for pollinating purposes.

commodity chain academic strand, they look at value chain which "consisted of multiple "nodes" or "boxes", each of which representing distinct production operations and chains linking them to each other" (Lee, 2010:5). Proposed as a tool to examine the geographical dispersion of production activities, scholars have suggested to identify through it which firms or countries "retained the most profitable nodes within the chain, thus uncovering the uneven distribution of profits among them" this view favorizes the specificities of each nodes varying in terms of "geographical loci of operations, forms of labor force, technology used [etc.]" (*Idem.*). The idea to examine it through nodes conception, but instead of looking at profit, keeping the concentration in nodes for diversion seemed interesting.

Furthermore, the idea of critical nodes, even though not specifically mentioned as such, is borrowed from economical geography and international political economy literature on the Global Production Network. As mentioned above, they describe it in terms of value creation, addition, capture and transformation (Yeung; Coe, 2015; Coe; Yeung, 2019). Selwyn contributes to this with a slightly different approach. Starting from a GCC standpoint, the main argument from selected articles is that firm-led transnational corporations (TNCs) exploit labor systematically.[22] In his most recent article, he proposes the notion of *poverty chains*, focusing on exploitation of labor. In such chains, Selwyn describes nodes of labor exploitation that have a syndicate leverage potential for workers and unions to bargain their rights. (Selwyn, 2013; 2015;2019).

Finally, the "node" concept is extremely present in network theory (computer sciences and network sciences), social network analysis (SNA) and actor-network theory (ANT) in which nodes can have different attributes. For instance, in computing science, it can

[22] I use TNCs and/or MNCs interchangeably although some argue they have fundamental differences.

be a unit or device with data of particular potential for the network, acting as a gateway which can receive, send and store information along different routes through a distributed network, for example.[23] For SNA, it would generally be a group of individuals in relation to a network and for ANT, nodes are constituted of objects and individuals; the similarity between the three is that nodes define a specific place, composed by different components and always ascribed to a network.

Based upon this non-exhaustive review, for the sake of this thesis I define critical nodes in the context of the opium industry as: microcosms within a network in which value can be created, captured, transformed, or logistically transported; considered as crucial because of their role in the supply-chain and in their potential of being exposed to illicit practices such as diversion.[24] This definition takes into account the actors and objects involved in those specific nodes, requiring that the actors and objects (such as regulatory instruments) combine a mixture of logics which can be subject to change over time.

Thevery few studies found which looked at diversion of licit production of opium focused on particular regions and other conceptual frameworks. No research was found that analyzed the role of the UNODC or was conducted with a network analysis of licit and illicit. This gap is addressed in this master thesis. Let us delve into the research design.

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[23] For more theoretical use of the *critical node* concept: in computer science, critical nodes are those the removal of which significantly degrades network connectivity. As a network can take different forms after disconnection, node criticality depends on how the network is disconnected once the node has been deleted, which depends on the objective of the application considered (Lalou *et al*, 2018:93). On a military perspective, critical node is an element, position, or command and control entity whose disruption or destruction immediately degrades the ability of a force to command, control, or effectively conduct combat operations. Also called *target critical damage point* (U.S. Department of Defense, 2005). So critical nodes for me takes this idea of diversion with the combination of value creation/transformation/capture inspired by the global production networks studies.

[24] Diversion "is the theft of opium at any point along regulated production and distribution lines" (Windle, 2012:56).

CHAPTER II. RESEARCH DESIGN

Research questions

What are the critical nodes in the global production network of opiates in which *licit* and *illicit* can become indistinguishable categories?

What is the role of the UNODC in the regulation of the critical nodes of controlled substances used for medicines?

Hypotheses

The current international drug control regime provides rules and norms on controlled substances. However, given the global production network and the considerable number of actors taking part in this specific industry, states and non-state authorities cannot fully implement the objectives of the three UN treaties on controlled substances. Instead, these authorities therefore are often in conflict with the ambitious and illusionary UN aim of ending the "drug problem".

I assume that there are critical nodes in the global supply chain of opiate-based medicine in which licit and illicit cultivation, manufacture, production, and transportation join at specific junctures, and in which they bypass the seemingly binary distinction

of lawful and unlawful activities. There are much more nuanced and diverse nodes, but I will focus essentially here on the exclusively licit channels, rather than on licit channels and activities that could interfere with illicit activities and channels.

It is often argued by international organizations that licit commerce, ever since it has been monitored, suffers from a very limited potential of diversion, and this does not refer to the level of the industry or other spheres. I will suggest that it happens much more than thought, and this can be largely explained by structural variables.

Furthermore, let us assume, based on global production network studies assumptions, that networks are dynamic and must remain so if they want to be viable. Dynamicity in this case can be illustrated in the continuous reconfiguration of the global production network of opiate. A current system can adapt due to diverse variables such international regulation (their evolution in time, as in the case of the scheduling of New Psychoactive Substances - NPS), state laws, market changes, illicit trade, and all these variables could be interdependent, therefore inducing a rearrangement within the whole network. This does not result in an entirely new system, but rather in a slight transformation and reorganization within the network. For instance, if a specific alkaloid is selected for regulation or change in the schedules, as occurred for thebaine – an opioid-alkaloid – this will result in the adaptation of domestic laws, changes in market behavior, restructuring of techniques and methods used in criminal activities, and also in the location of critical nodes in the global supply-chain and the methods used for diversion purposes.

This could also be applied in many ways. For example, to manufacture heroin, one fundamental precursor – a chemical needed in order to create a controlled substance – is acetylanhydride. Acetyl anhydride is thus necessary for heroin, but due toits use in various sectors in legal activities, it is difficult to properly monitor the trade flow of this chemical. Sometimes human beings

involved in illegal activities will find very creative ways either to gain access to this specific chemical by extending their network, or by producing what is defined as pre-precursors/design-precursors. The latter is a chemical that can be used in substitute of the main chemical, or a base from which another chemical, easier to access, can be transformed to have the solution needed in order to produce the final substance desired. By doing so, regulators are faced with pressure to retain an adequate control and should adapt their strategies, which would thenresult in structural changes.

But also, external and environmental factors can have an impact on the structure of the global production network. Technology, machinery,research and development findings are all domains where in fact, discoveries of this kind can revolutionize the whole functioning of an enterprise and its organization.[25]

The industry level is characterized by a "fragmented-yet-coordinated nature of global production systems" (Coe; Yeung, 2019), webs of actors "originating from different home economies and endowed with different ownership structures, corporate cultures might respond differently to competitive dynamics and risks" (Coe; Yeung, 2019). Such description can well apply for controlled substances too. The responsibility borne is fragmented amongst actors, while its compliance is state sovereign. In regard to international trade and laws, there are usually similar principles unless there is a conflict (in which case the WTO can intervene). In addition, I assume the various actors involved in the plant-based pharmaceutical supply-chain "deliberately *dissociate* themselves from the negative aspects of commodity production" (Ibert et al., 2019 in Coe; Yeung, 2019: 793) but also for the cultivation,

[25] To detect or control diversion from happening, the former DEA agent mentioned, for instance: GPS tracking, technological inventories, analytical programs and software programs. He also confirmed that, for example, blockchain or automated dispensing machines (ADM) can change the routes and functioning of these examples and can even slightly change the nodes. For instance, prior to an ADM service in a hospital, certain diversion practices were found, and it could happen that an ADM engineer end up getting into diversion itself (Titan group DEA, 2020).

manufacture, transportation and until consummation. It is as if each piece of the puzzle carries its own responsibility, through various means of requirements and compliance, essentially applying certain market principles as this is the most functional option in terms of cost-benefit, for all parties involved. To avoid any confusion, rather than questioning the whole system, I will aim to transcribe the structural logic of this industry, in order to understand who-does-what and who-gets-what.

Another hypothesis is based on the role of the UNODC on critical nodes. I assume that the UNODC participates in various ways, for example through the creation and use of instruments to count, observe, accept or condemn the existence of critical nodes, through cooperation with other international organizations (such as the WHO) or agencies (INCB, INTERPOL, EUROPOL). The UNODC as a United Nations Office does not deny the existence of critical nodes but wishes to avoid devoting too many resources to them. These assumptions are reasonable for a number of reasons, such as the fact that it would question the current system in place, its falsifiability and the very purpose of the UN treaties –the supply of essential substances for medicine.

Moreover, the UNODC does mention and act on certain fronts on the subject but somehow accepts its very own limitations on its potential for action. Ultimately, the UNODC cannot, and does not want to be sovereign on signatory parties. Furthermore, the UNODC as a whole must choose its battles and is confronted with a "lesser evil mental phenomenon" – whether it be conscious or unconscious, admitted or unadmitted. Since the UNODC's work is related to drugs and crime, their focus is crime related, and embraces all kinds of criminal activities. Diversion and/or the critical nodes of licit trade act as a counterbalance to other crucial issues such as human trafficking or the arms trade, which instinctively prevail over the detour or smuggling of supposedly legitimate business.

Finally, it is possible that some of the incoherencies that might be discovered, or the network that is aimed to be outlined, may be inherent and essential to the substance examined. The ambivalence of drugs in their remedy-or-poison aspect can be seen in their use, but in their sales as well, each being an expression of the same roots. This ambivalence is ubiquitous. In treaties, one can find the state's needs for medication based upon controlled substances, while in parallel willing to stop the *evil* of drug use. This is supposed to work with the previous year's estimated needs, serving for the estimated production needs of the following year. Since access to medicines is a necessity in global health, one side cannot exist without the other, thus, illicit activities will constantly take place. Although there might be better ways to manage it, this is beyond the scope of this study. Therefore, the objective to suppress and eradicate trafficking, diversion and so on, is only a target at which to aim, as it is impossible to truly eliminate these factors.[26]

To conclude, my general hypothesis can be phrased as follows: even in licit – and controlled - global trade of opiates, illicit aspects co-occur throughout, from cultivation to consumption. Such illicit activities are believed to be condensed in nodes – which can change over time – in the global production network of this controlled substance. The purpose of the regime is therefore to control, in order to limit. Given the justification above, the question should focus on limitation and not prohibition. My hypotheses can be summarized as follow:

H1: There are critical nodes in the licit global supply chain of opiate-based medicine in which licit and illicit practices meet at specific junctures.

[26] As former DEA responded to one of my questions as follows: "I love your question though. And in other words, what is the lifespan of compliance? I swear to God, the lifespan of compliance is pretty much, the minute we walk out the door, they're already going downhill. Because people just can't seem to keep compliance, you know, compliance standards where they need to be." This highlights the importance of practice as a whole, and everyday practice (Titan group DEA, 2020).

H2: The UNDOC has a distinct role but cannot and does not wish to do more than what it currently does.

Unit of Analysis – the actors

It is important to specify that the first research question is formulated in such a way that part of the analysis aims at highlighting the complexity of the actors in the global production network of the medical opium industry through the instruments in order to map the network for prospecting critical nodes. However, my unit of analysis for the second research question is to expose what is done about critical nodes in the network described, by examining the role of one international organization of the UN apparatus – the UNODC based in Vienna.

In terms of states, they play an important role in the licit as well as the illicit global production network. Perhaps this has not yet been emphasized enough earlier when outlining the illicit international political economy and international political economy, but by combining theoretical perspectives, in this work we see licit and illicit as one, while focusing only on critical nodes. States through:

> *"its many activities and interactions with corporate and other non-firm actors, [are] seen to influence directly and indirectly the processes of value creation, enhancement and capture that take place both within and across the borders of, its territory." "[…] National state plays the role of an "inter-scalar mediator" in seeking to facilitate, enhance, prolong or indeed end the strategic coupling of particular regions within its territory with global production networks (Lee, et al 2014; Horner, 2014; Hsu et al, 2018)." (Coe; Yeung, 2019: 782).*

Therefore, it seems appropriate that if states have those characteristics when addressing legal commerce, one can see the above as rightly applying to illegal commerce as well. In consequence, Horner's description of states' four various roles is

useful: “regulator: setting the rules of the game - particularly through labor regulations and foreign direct investment/trade policies; producer – through the activities of state-owned and government-linked corporations of different kinds; buyer – through large-scale public procurement; investor in certain contexts through the activities of sovereign wealth funds.” (Horner, 2017:7-13).[27] It is also important to keep in mind how a range of state initiatives not just shape but also are shaped by their positioning in global production networks (for e.g. in the case of transit countries). Moreover, one should note that states attemptto have key *quality* segments to govern rather than *quantity* segments to control. Indeed, regal powers have diminished over time, and transferred to non-state authorities in various domains. Thus, states have limited power when it comes to certain subjects, in which non-state authorities now have mastery. As Strange (1996:4) argues: “where states were once the masters of markets, now it is the market, on many crucial issues that are the masters of governments states”. Without agreeing to such an extent, this thesisaims for a better understanding of states roles in the context of “untangle the complex web of overlapping, symbiotic or conflictingauthority” (Strange, 1996: 99) in the sector of opiates.

Methodology

The methodology applied in this master thesis is largely qualitative – in the data collection - and post-positivist in both the data collection and analysis. This type of research is based upon a case study structure. This means that the opiate industry and the international regulation in place are examined in order to transcribe, when possible, general observations on the topic. The case study is exploratory and inductive, in the sense of assuming no prior knowledge, a choice which made learning about the topic possible while researching it. It has the purpose of being descriptive –

[27] Please see appendix 1 for Horner’s table on the four states roles.

explaining how it works – which can be linked with the analytical tools borrowed from the Global Production Network. But it is also evaluative, for once the context has been set, and the map has been described, it will focus on how the UNODC participates in critical node regulation, which constitutes an evaluation.

The post-positivist approach is a normative one, believing that as individuals, we cannot have axiological neutrality, we interact psychologically with our object of study, even while trying todistance ourselves from limiting thoughts. I also study the topic with a constructivist mindset. This does not constitute an approach *per se* but rather, it allows me to avoid taking for granted the kind of data at disposal. In terms of the empirical corpus, the types of data are overall desk-research based apart from the eight expert-interviews. Most of the primary sources are official reports and documents, treaties, laws, official declarations, research on websites of official actors. Reports were selected from a contemporary timeframe, i.e., in the past ten years, apart from pharmacologist documents (to evaluate the technological evolutions of methods for the production of medicine).

The reports were selected from various sources, mostly the UNODC, for example the World Drug Report 2020 and 2019 divided in six booklets, the annual reports of the UNODC (2018, 2019) as well as bulletins of various years on opium poppies cultivation and manufacture, and the multilingual dictionary of narcotic drugs and psychotropic substances under international control (MLD). On the INCB side, the following sources were used: the annual report of 2019, “Progress in ensuring adequate access to internationally controlled substances for medical and scientific purposes” in 2018, “Precursors and chemicals frequently used in the illicit manufacture of narcotic drugs and psychotropic substances” in 2019 and the “Estimated World Requirements for 2020” based on the statistics of 2018 named the “Narcotic Drugs 2019”, the “Yellow List” of 2018 and 2019, which is a list of narcotic drugs under

international control, and finally, some Ministerial Agreements concluded at the CND in 2019. In addition to scrutiny on their websites, these gave me perspective and trends on controlled substances and the work done by these institutions.

Reports from the EUROPOL were also consulted, such as "EU Drug Markets Report 2019" co-written between EMCDDA and EUROPOL, as well as other documents from the INTERPOL websites and from many other NGOs and think tanks and consortiums including: the international drug policy consortium (IDPC), the international development research center (IDRC), the Global Commission Drug Policy (GCDP), Transform Drug Policy Foundation, the Royal United Service Institute (RUSI), mostly Swiss drug dependence associations such as Addiction Suisse, Addiction Vaud and *Groupement Romand d'Etudes des Addictions* (GREA), and finally, some reports from the WHO about access and counterfeit medicines, with essential medicine lists and reports from the ECDD. They were based mostly on opacity/transparency, right to access, patents, drug dependence, etiological considerations. Scholarly articles of primary sources were also explored, specifically on theoretical approaches, and on the object of study – opium.

Webinars were attended, on "Transparency and Access to Medicines: One Year After the WHA Resolution", the 73rd World Health Assembly Week; "Trade Responses to Global Health Crisis" and "Policy Concerns and Ideas on How to Strengthen the Situation in the Trade of Vital Medical Supplies". Participation in nine conference calls organized by the American Swiss Foundation, special program during the global pandemic, three out of nine contained information on pharmaceutical industries, medicine, and dependencies on international trade on necessity goods such as particular chemicals or active pharmaceutical ingredients (API) in relation to the pandemic and general observations and previsions for industries, politics, policies and reconfigurations. They were calls of

40 minutes, with participants from all walks of life and positions – American and Swiss politicians, ambassadors, industry leaders (out of which some pharmaceutical industries CEO/COO/employees) etc. These conferences gave an overview from an economic approach regarding the true uncertainties we face today – and their growing importance – since the beginning of COVID-19. In order to analyze such data, methods from critical discourse analysis are used, not only to highlight patterns, meanings, double meaning and relations between actors within a sector and between sectors but also to examine instruments and events.

In addition, data has been collected from expert interviews, conducted mostly online, applying a semi-structured interview method. The introduction of the requester was on an informative basis, as a second-year master student in political science specializing in globalization. Brief comments on the topic of the master thesis would be announced, i.e., legal and illegal activities surrounding the narcotics trade. Interviews were initiated by email or telephone. A number of contacts were made with other organizations, some of whom wished not to be addressed for various reasons. On this basis, if accepted, questions would be sent – if requested and prior to the interview, giving the candidate time to prepare.[28] For a couple of interviewees, the respondents wished not to be recorded and to remain anonymous. These wishes have been duly respected while adhering faithfully to the criteria of scientific research. Due to the obvious technicalities of the subject, it is rare to find someone who knows *everything* on the topic. The purpose of these interviews are, among other things, to question certain accepted or common-sense thought systems and beliefs, to be instructive on confused and unclear elements, to highlight inter-actor dynamics and specific mandates between actors, and finally to

[28] For an overview of all the questions sent and the responses of the conducted interviews, please contact the author directly: c.yousefzai@gmail.com

expose different cultures according to selected “representative” people of particular environments.

Between the months of July and December 2020, eight interviews were conducted with experts in the field. Chronologically, the first interview was with Dr Dilkushi Poovendran. She is a technical officer at the ECDD Secretariat, Access to Medicines, Vaccines and Pharmaceuticals Cluster. The ECDD is a scientific advisory body to the WHO that consists of an independent group of experts in the field of drugs and medicine and drug dependence liability. They make direct recommendations to the Commission on Narcotic Drugs (CND) chaperoned at the UNODC. The interview lasted about an hour.

The second interview in the month of July 2020 was with a doctor who retired as the director of global medical safety in a multinational pharmaceutical industry. He wished to remain anonymous, and the interview, which was not recorded at his request, lasted two hours. From this interview, a clearer vision emerged of the industry configuration, logics, norms and values. The third interview conducted in August 2020, was with a doctor based in Lausanne and specialized in addictology, who wished to remain anonymous, and lasted thirty minutes. This interview allowed me to explore the addictive side of the substances and have her thoughts on *“questions she never asked herself”* on the supply of controlled substances.

The fourth interview was online in October 2020, with the director, Jack Teitelman and managing partner Kelley Detweiler of Titan Group DEA, a New York compliance business. They are former DEA agents who specialize in diversion of controlled substances; they provide training and conduct compliance throughout the health sector in the U.S. The interview lasted forty-five minutes and was recorded. It was particularly informative and gave interesting insights.

The fifth interview was in-person in October 2020, at the CHUV with Dr. Laurent Schild. He is a professor of biology at the University of Lausanne, and permanent member of the Swissmedic expert committee, as well as being a member of the standing committee on medical products of the CHUV and President of the Federal Medicines Commission which advise the Federal Office of Public Health and the Federal Department of Home Affairs with the aim to guarantee adequate supply of medicine to the Swiss population.

The sixth interview was held online in early November, with Kahlid Tinasti, director of the Global Commission on Drug Policy and an Expert in the Network of the Global Initiative against Transnational Organized Crime, and the author of scientific and policy papers and research. He is an active advocate for change in the current control regime; thus, it was particularly interesting to access his views on the topic and nexuses of the master thesis.

The seventh interview was in November 2020, on the phone and lasted one hour. The person interviewed is the head of the international drug affairs at the Federal Office of Public Health at the Swiss Confederation, Diane Steber Büchli. An expert in her field, she provides important insights not only on how a government, in this case the Swiss one, tackles such issues, but more importantly, what matters one must bear in mind, given the complexity of the subject. She is mostly specialized in access to and availability of medicines in Switzerland, and therefore her point of view may be different than that of a law-enforcement or monitoring perspective.

The eights interview was conducted on the phone and lasted thirty minutes. The discussion was with a veterinary doctor based in Switzerland in December 2020. He had worked with pet animals mostly, in animal refugees, animal hospital and had his own cabinet. This discussion gave me his perspective and many insights from this sector.

In terms of interviews or contacts sought but not obtained, they were as follows: attempted contact with the UNODC with various messages left by phone, but no results; initial contact with the INCB, but they said they would only communicate with states. There is still one person expected to respond to emails sent to the Executive Officer at the ECDD, Dr Gilles Forte, who works for the director general of the ECDD and is the coordinator at the Access to Medicines, Vaccines and Pharmaceuticals Cluster. A few exchanges were made but no responses were obtained yet.

I have had email and phone exchanges with INTERPOL and EUROPOL, both of whom told me they had sections in which they consider these matters, but due to the sensitivity of the topic and the discretion they must keep, I could not expect to receive more information than what was already visible on their website. Finally, I had the opportunity to ask questions to medicrime (a branch of Swissmedic). The enforcement officer who responded on their behalf answered all my questions, for which they had asked the questions to be short and concise, and in binary format – yes/no. Swissmedic is the Swiss authority responsible for the authorization and supervision of therapeutic products. It is a federal public law institution and is autonomous with respect to its organization and management and has its own budget (Swissmedic, 2020).

In terms of secondary sources, many newspaper articles were consulted, particularly in relation to the opioid crisis in North America, and pharmaceutical industry scandals. A broad range of scholarly articles from different branches were studied (e.g., pharmacology, technology, medicine) which were necessary to understand the scope and range of the topic. Books were also used, mostly relating to international political economy, illicit markets, criminal activities, and narcotics. Finally, four documentaries produced by the RTS, Arte and RT were watched. They were on the history of drugs, on opium wars, commerce of drugs and trafficking.

For the industrial analysis of the global production network, I used a corpus of newspapers, industry website research, logistics companies, various databases for exports/imports, and international distribution of production and consumption data such as on comtrade (UN) and atlas (Harvard) as well as Statista, which helped to grasp an idea of the global licit commerce of opium alkaloids and its derivatives. The use of international instruments such as harmonized names, codes or through certifications were observed. Data collected through interviews, webinars and conference calls helped to construct the section. By using a mapping technique as suggested in the global production network studies, this has been able to provide "the possibility of visualizing the economic and social agents as well as highlighting the structural and spatial dimensions of networks, sectors and the linkages between them" (Henderson *et al*, 2002 :457).

Overall, the whole process has been largely inductive, finding information, which was often contradictory, misleading and diverse - for instance in the scientific side of pharmacology, the terminology used across the spectrum is heterogeneous. Indeed, when talking about opium and its derivatives, one should keep a lexical booklet to track terms and usage. As Williams (2010) says "terminologies are difficult purposely" as this commodity is "not ordinary merchandise" (Wood 1988:149 in Williams 2010:292).

According to Wood's conclusions (1988:164) when studying the monetary significance of the crop to growers of opiates, obfuscation is intended "as the whole industry has been handled with an air of secrecy; for example, even the official agricultural census publications refer to "oil poppies" when the main purpose of production is pharmaceutical". Thus, I adopt Williams' view that "deconstruction is a useful tool for interpreting such discursive silences and duplicity, and it has a specific relevance in this context". Yet even the tone in which the information is communicated between actors is noteworthy, whether delivered in *pathos*, *logos* or

somewhere in the middle. This topic has high moral attributes and has been debated socially for a long time. One should remain attentive on the form of the language used.

In addition, there has been a gap in the data corpus between what I ought to gather and what has been gathered. Access to people was often difficult; the current situation of the covid-19 pandemic added complexity as some of the experts sought have been fully mobilized elsewhere since late February 2020; the theme itselfcan be a barrier to discussion, and many opacities surround the data.Even the methodologies used in the official reports all have one common aspect: their irregularities. Firstly, the data on consumptionis difficult to assess due to the confidential and/or illegal nature, secondly, treatment and emergency rooms are subject to medical discretion, and thirdly, data on illegal drug trafficking are mostly compiled by drug seizure numbers, and finally surveys for consumption estimations that are sent are different, completed by different authorities which leads to radically different conclusions asto the scale and intensity (Manski *et al*, 2001; Musto;Sloboda, 2003in Buxton, 2006: 69). Also, the INCB data relies largely on state estimates, which again, methodologically speaking, is not neutral. Thus, quantitative data remain only ‘guesstimates’ and not precise numbers. However, they allow imagining its potential.

CHAPTER III. THE INSTITUTIONALIZATION OF THE INTERNATIONAL DRUG CONTROL

In this chapter I aim to lay the ground on the institutionalization of controlled substances and most specifically, opium. This is important to acknowledge in socio-historic terms as it paved the way to the apparatus we face today. I will explore the two identified periods in the control regime building.

For millennia, plant-based substances have been used in various forms and for different purposes. Their utilities were based on traditional cultural norms, medical and recreational use and even manipulative ends in strategic security matters by agencies (e.g., in counterinsurgency). More generally, five functions can be attributed to drugs: pain relief, physical stimulation (for example in arduous employment), relaxation, food sources and means of exchange in early trading system (Inglis, 1975).

Substances have had a contingent socio-historical aspect and are part of specific *Zeitgeists* and illustrate *Weltanschauungs*. Indeed, substances were not always controlled, but are the result of political action, its transfer to law, and the enforcement of this law. Therefore, for the majority of controlled substances that are illegal today, most were actually legal a hundred years ago. Institutional

and legal changes happened over time as a result of numerous events including the opium wars, diasporic movement of people around the world, scientific discoveries, chemical experiments, industrial development such as the rise of the pharmaceutical industry, and globalization more generally. Some of these changes acted as *focusing events* (Birkland, 1998) whilst others, lasting longer in time or implication, which paved the way to today's institutional regime framework.

The justification for initial regulation by states was based upon problem-solving mindsets. The considerations and actionswere mainly driven by socio-economic, political and religious ideologies. The United States has been a crucial player of theinstitutionalization of prohibition and moral values concerning drugs since long before it declared the "*War on Drugs"* and drugs became "public enemy number one" as famously stated by Nixon in1971 (Niesen, 2011).

But as previously stated, substances have been used for both medical and recreational purposes. As described by Mitchell (2012:228), in Mid-Victorian Britain, one could walk into a chemist's shop, buy without prescription laudanum (popular beverage made out of opium and alcohol), cocaine, arsenic, opium preparation (which were freely sold in market halls) until 1868. He mentions on the same page that "they could be bought like any other commodity." There was no moral condemnation, and their use was rather seen as a habit. It is only in the 1860s with opium dens that campaigns against unrestricted opium begun (Diniejko, 2008). These statements illustrate the long construction of this matter, into, first, domestic policy agenda setting before getting into the international agenda.

It is interesting to note that besides the debates taking place, considerable impact was felt on public policy by scientific developments and discoveries, as well as from the rise of the pharmaceutical industry, such as the identification of opium's first

active pharmaceutical ingredient. Discovered in 1805 by the German apothecary Sertürner, and with the help of the work of the French chemist J.L Gay-Lussac, their work had already been published in 1817 (Brook; Bennett; Sukumar, 2017). [29] From 1898,Bayer had manufactured and marketed diacetylmorphine (also named diamorphine), as a "safe and nonaddictive" substitute for morphine, to cure coughs for adults and children, trademarked as "heroin" (Goodman; Gilman, 1941).[30] The use of morphine and diamorphine during the 19th century helped ease pain as the most powerful analgesic of its time, but also contributed to drug addiction.Problems of self-medication, dependence and side-effects started to raise awareness in societies, was then seen not only as a habit but also as something which could have negative consequences on people.

A description of the institutionalization of the international drug control regime is necessary as it will clarify the practices and philosophical assumptions underlying drug-related conventions. This contextualization will help for my main focus, i.e., controlled substance in international regulation and in practice. Although rudimentary and non-exhaustive, it will provide a framework from which to apprehend the control regime.

From 1909 to 1953

Two periods in history defined this institutionalization: a first one from 1909-1953 and the second one from 1961-1988. The first period began with the desire to end, *for good,* the Opium Wars.Two periods in history defined this institutionalization: one was between Great Britain and France against China (and also financed or helped by the US and Russia) in 1856–1860 (Maguet; Dumand, 2011: 60-63; Hanes; Sanello, 2002). At the insistence in particular

[29] For a timeline highlighting important periods in the history of opium and morphine use from a medical and pharmacology perspective, see Appendix 2.
[30] An example of advertising is provided in Appendix 3. It is interesting to see patterns of practices perpetuating. In the opioid crisis, the "non-addictive" argument was put forward when marketing oxycontin.

of the US and of two important figures, Anslinger and Wright, the implementation of anti-opium movements called for a Conference in Shanghai in 1909. It is important to note the figures and movements roles in the United States, but also more broadly other societies and groups such as the Society for the Suppression of the Opium Trade in the U.K. and in the 1930s the Canadian, Colonel Charles Henry Ludovic Sharman (Messac, 2016) who were as Nadelmann (1990) coins “transnational moral entrepreneurs”.

The focus at that time was on the supply chain of opium in order to control its availability, and to export it to different countries. During the 1912 International Convention of Opium at the Hague, the primary usage of opium for medical and scientific research only was sought, notably by Charles Henry Brent of the Episcopalian Church and US President Theodore Roosevelt. This meant that medical and scientific purposes would be considered legal, and all other uses defined as illegal. A national control system was desired, and the pharmaceutical industry lobby started to become prevalent in the debate.

The next discussions on Opium took place during the Treaty of Versailles, when it was agreed that a control organism would be established, the Opium Advisory Committee (OAC) and the creation of a *hygiene organ* (the precursor of the WHO), which would later timidly explore the socio-medical aspects of this subject. The next convention was during the Geneva Opium Convention in 1925, more transnational controls were sought but colonial powers were reluctant to agree due to the economic and revenue considerations opium had for them.

In 1931, the Geneva Narcotics Manufacture andDistribution Limitation Convention concluded in the start of statistics estimations for the production of substances based on each signatory party’s needs. This means that from this point, the creationof estimates began in order to stock defined substances for domesticneeds. Statistics would be maintained to keep track, observe

tendencies, and presumably, the international authorities be better equipped to avoid diversion from licit production.

As for the Suppression of the Opium Smoking Agreement, in Bangkok, it was considered a failure, as no decisions were made on any of the important points (New York Times, December 20th, 1931). This was mainly because colonial powers were unwilling to give up their economic gains and the United States was alone in its attempts at restrictions and controls.

Until this point, illegal trafficking was not a criminal offense and the objective had been to regulate and restrict trade. Since the 1936 Geneva Trafficking Convention, illegal trafficking has been considered a criminal offense punishable by law. As it was considered ineffective by the US, this Convention never gained widespread acceptance, especially in relation to extradition rights and since the confiscated goods would further weaken the local systems already in place.

When the United Nations assumed the functions and objectives of the League of Nations, the UN Economic and Social Council (ECOSOC) took responsibility of controlled substances through the Commission on Narcotic Drugs (CND), replacing the OAC. These changes were amended at the Protocol of Luke Success in New York in 1946 (Sinha, 2001). In 1948, the first socio-etiological considerations were discussed, and the creation of an expert committee on drug dependence in the WHO was formed. This gave the WHO some authority in deciding which drugs should be placed under control, under certain guidelines and criteria (Bruun; Pan; Rexed, 1975: 70).

Finally, in 1953 the New York Opium Protocol was discussed essentially along the lines that it would be easier for everybody to make an international trade monopoly of opium so control could be highly effective. However, fears of restriction and higher prices resulting from many states stockpiling, but also stated who accommodated fruitful pharmaceutical industries, opposed to

this initiative. The idea was then left behind. Apart from other minor changes, this Protocol never received ratification, and then, 50 years of negotiations transformed into the 1961 UN Single Convention.

To summarize, this initial period was replete with conferences, conventions and treaties being promoted by prominent figures and associations, together with the societal transformations and scientific and technological developments at the time, as well as the creation of international organizations like the League of Nations and the United Nations. These variables were important in what we know of today's control regime. An awareness of the many variables that have impacted the peculiarity of the establishment of the control regime is thus essential in understanding the first period of this institutionalization process. Let us now pass to the second period 1961-1988, illustrated by three conventions, the most relevant ones for today's context.

Figure 1 : Summary of multilateral agreements [31]

Date and Place Signed	Title of Agreement	Date of Entry into Force
26 February 1909 Shanghai, China	Final Resolutions of the International Opium Commission [1]	Not Applicable
23 January 1912 The Hague, Netherlands	International Opium Convention	11 February 1915 / 28 June 1919 [2]
11 February 1925 Geneva, Switzerland	Agreement concerning the Manufacture of, Internal Trade in, and Use of Prepared Opium	28 July 1926
19 February 1925 Geneva, Switzerland	International Opium Convention	25 September 1928
13 July 1931 Geneva, Switzerland	Convention for Limiting the Manufacture and Regulating the Distribution of Narcotic Drugs [3]	9 July 1933
27 November 1931 Bangkok, Thailand	Agreement for the Control of Opium Smoking in the Far East	22 April 1937
26 June 1936 Geneva, Switzerland	Convention for the Suppression of the Illicit Traffic in Dangerous Drugs	26 October 1939
11 December 1946 Lake Success, New York, USA	Protocol amending the Agreements, Conventions and Protocols on Narcotic Drugs concluded at The Hague on 23 January 1912, at Geneva on 11 February 1925 and 19 February 1925 and 13 July 1931, at Bangkok on 27 November 1931, and at Geneva on 26 June 1936	11 December 1946
19 November 1948 Paris, France	Protocol Bringing under International Control Drugs outside the Scope of the Convention of 13 July 1931 for Limiting the Manufacture and Regulating the Distribution of Narcotic Drugs, as amended by the Protocol signed at Lake Success, New York, on 11 December 1946	1 December 1949
23 June 1953 New York, USA	Protocol for Limiting and Regulating the Cultivation of the Poppy Plant, the Production of, International and Wholesale Trade in, and Use of, Opium	8 March 1963
30 March 1961 New York, USA	Single Convention on Narcotic Drugs, 1961	13 December 1964
21 February 1971 Vienna, Austria	Convention on Psychotropic Substances	16 August 1976
25 March 1972 Geneva, Switzerland	Protocol amending the Single Convention on Narcotic Drugs, 1961	8 August 1975
20 December 1988 Vienna, Austria	United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances	11 November 1990

[1] This is the only document in the Table that is not an enforceable multilateral treaty. It is included because it marks the beginning of substantial international cooperation on the control of drugs.
[2] China, the Netherlands, and the U.S. put the Convention into force among themselves in 1915 (they were joined later that year by Honduras and Norway). Only when the Convention was made part of the Versailles Treaty in 1919 did it come into force globally.
[3] As amended by the Protocol signed at Lake Success, New York, on 11 December 1946.

(Sources: Canadian Treaty Series; Kettil Bruun, Lynn Pan and Ingemar Rexed, *The Gentlemen's Club: International Control of Drugs and Alcohol*, Chicago: University of Chicago Press, 1975; United States, *International Narcotics Control: A Source Book of Conventions, Protocols, and Multilateral Agreements, 1909-1971*, Washington, D.C.: Bureau of Narcotics & Dangerous Drugs, 1972.)

The second period: from 1961 to 1988

Single Convention on Narcotic Drugs of 1961 as amended by the 1972 Protocol

The "Single Convention" signed in New York in 1961 and amended in 1972 by the additional protocol has played an important formative role in the contemporary international drug control regime.[32] The aim of the "Single Convention", as stated in the

[31] Source: Sinha, 2001:8
[32] The amended protocol of 1972 tightens the control of production, use and distribution of narcotics, illicit narcotics and added dispositions for the treatment and re-adaptation programs for addiction (Sinha, 2001).

convention is "to replace by a single instrument the existing multilateral treaties in the field, to reduce the number of international treaty organs exclusively concerned with control of narcotic drugs, and to make provision for the control of the production of raw materials of narcotic drugs." As mentioned in the Preamble, they recognize the medical use of narcotic drugs, and recognize that addiction to them constitutes a "*serious evil* for individuals with social and economic danger" and that they must "prevent and combat this *evil*".[33] They call for universal action and international co-operation. The language used in the Preamble is particularly telling in the ideology underlying the Single Convention. At the time the convention was created, five groups were formed according to their drug control stance and objectives (Sinha, 2001:19-21). These groups will be outlined briefly.

The first group was the *organic group*. Constituted of traditional producers of organic raw material (narcotics, coca, cannabis), they were open to socio-cultural organic drug use and favored weak control due to existing restrictions and domestic impacts but supported national control based on local conditions. They sought development aid to compensate for the losses. Countries such as India, Turkey, Pakistan and Burma took the lead role, and states of Indonesia and the Andean region of South America participated, as did the opium- and cannabis-producing countries of South and Southeast Asia, and the cannabis-producing states in the Horn of Africa (*Idem.,*).

The second was the *manufacturing states group*. As Sinha (*Idem.,*) states: they had "no modern cultural affinity for organic drug use and being faced with the effects of drug abuse among their citizenry, they advocated very stringent controls on the production of organic raw materials and on illicit trafficking." They were the primary manufacturing states of synthetic psychotropic drugs,

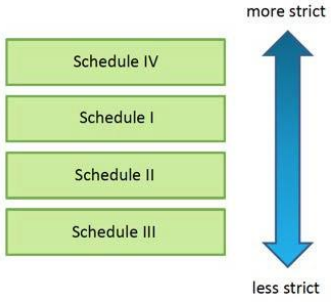
[33] *Evil* is italicized by the author

lobbied with industry, they wanted a minimum regulation. They were in favor of supra-national control (for which they would continue to exercise de facto control). Western countries such as the U.S., the UK, Canada, Switzerland, the Netherlands, West Germany and Japan were part of this group.

The third, called the *strict control group*, involved countries that were non-producing and non-manufacturing with no direct economies at stake in the drug trade. They were culturally opposed to drug use and encountered domestic addiction problems. They favored drugs for medical and scientific uses. They accepted a supra-national body although it would mean losing some national sovereignty. The key countries were France, Sweden, Brazil and Nationalist China (*Idem.,*).

The fourth, the *weak control group*, had no interests in the drug trade with little problem of addiction domestically; this group was against a supranational body. It was led by the USSR and its allies (*Idem.,*). As for the last, the *neutral group*, they were interested mostly in being guaranteed sufficient drug supplies. They were constituted by African countries, Central America, Sub-Andean South American, Luxembourg and the Vatican (*Idem.,*).

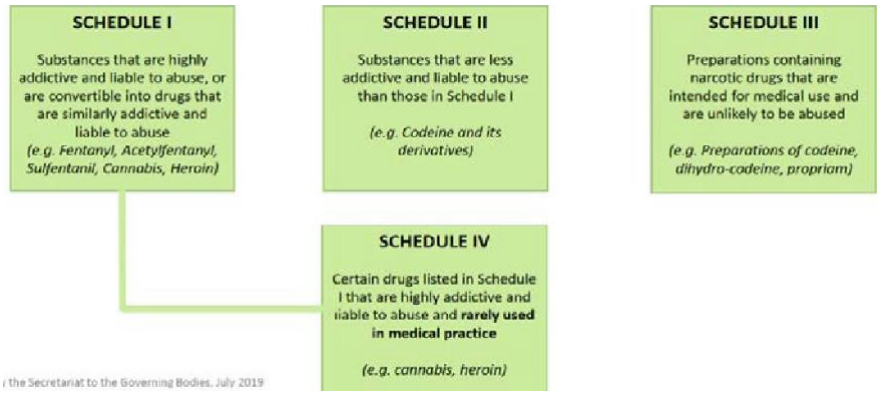
Figure 2 : Schedules



These groups agreed that substances should be categorized into so-called schedules (I, II, III, IV), for which different levels of controls would apply. Schedules I and IV are the strictest while Schedules II and II are less so. The scale of control is based upon criteria that have been defined according to "the dependence potential, abuse potential and therapeutic usefulness of the drugs included in them" (Global Commission on Drug Policy, 2019:4). Scheduling decisions are taken by the Commission on Narcotic Drugs (CND) which was established by the ECOSOC.

The WHO makes recommendations on the advice of its Expert Committee on Drug Dependence (ECDD), then sends these to the Secretary General for approval before submitting them to a vote at the CND (Global Commission on Drug Policy, 2019:4). The revised list of drugs in Schedules I, II, III and IV of the Single Convention on Narcotic Drugs of 1961 as amended by the 1972 Protocol is contained in the "yellow list" a list of all the narcotic drugs under international control, prepared by the International Narcotic Control Board (INCB, 2018). The process for making a request for modification in the schedules is dissimilar depending on the requesting party. In general, under specific medical or scientific evidence such as ill effects, abuse potential and therapeutic advantages, the WHO (through the ECDD) or signatory parties can recommend a change (either through the general secretary at WHO or ECOSOC first). Then the recommendation must be voted upon by parties at the Commission on Narcotic Drugs (CND) in Vienna, with a simple majority vote.

Figure 3 : The Secretariat of the CND outlines the schedules from I to IV [34]



These schedules imply various measures depending on the level of schedule. However, for all four schedules, the production, manufacture, export, import, distribution of, trade, use and possession must be limited exclusively to medical and scientific purposes (Art. 4(c).). Licensed persons and enterprises as well as all

[34] Secretariat to the Governing Bodies, July 2019.

steps in the manufacture, trade and distribution of international trade are to be controlled through governmental licensing (Art. 29, 34 (a), 30 (1)). Furthermore, estimates must be furnished to the INCB for future drugs requirements (based on the previous year's trends) so that there is a balance between supply and demand (Art. 19 (1). 21. 29 (3), 31 (1b), 30 (2a)). And finally, all participants in the narcotic trade are required to keep detailed records of any transactions in drugs (Art. 34(b)).[35]

Two specific comments can be made related to the Single Convention; the first, is the strictness of the limitations of opium international trade to state monopolies (Art. 23-24) and the supposed abolishing of quasi-medical use of opium, opium smoking, with all their production and manufacture (Art. 49). Traditional countries, only, had 25 years, for others prohibition would have been immediate. By 1989, these practices became fully prohibited and the drugs can only be used domestically regulated medical and scientific purposes. This is obviously not the case in practice today but in theory this is the context. The second comment applies for the articles 23-24: opium trade is not limited to state monopolies, and the information gathered by the INCB is not publicly available (apart from the reports they publish).

Convention on Psychotropic Substances 1971

During the 1960s, due to post-WWII effects, such as soldiers' and veterans' addiction, the availability of synthetic substances flourished, and addiction became an important concern to many states. The useof amphetamines, barbituric and LSD was high. The need for regulation on these substances then became a necessity. In this context, the Single Convention was taken as an example to create another convention on psychotropic substances, which I shall refer to the 1971 Convention hereafter.

[35] For detailed tables on all the control measures and exceptions for each schedule, please refer to appendix 4.

In this respect, CND/INCB would have administrative authority, and distinguished levels of controls for different drugs organized in schedules, mandatory transaction documentation and licensing, an import/export control system, illicit trafficking and penal provisions were applied (Sinha, 2001: 24; Kusevik, 1975 :39). This convention however is much weaker in terms of controls imposed. It has been said that blatant corporate influence of pharmaceutical industries made this possible (McAllister, 2000: 232; Kusevic, 1975:39; Sinha, 2001:25).

While there were five groups in the Single Convention, two groups were formed in the discussion of the 1971 convention, with fundamentally advanced reverse arguments than in 1961. The first was the *manufacturing group*, counting mostly industrialized countries, with pharmaceutical industries and psychotropic substances markets, and asking for weak control and national sovereignty prevalence over that of a supranational body (Sinha, 2001:25). The second was the *organic group* of developing countries supported by socialist nations, with little interest in this industry, which pushed for strong control as in the Single Convention (*Idem.,*).

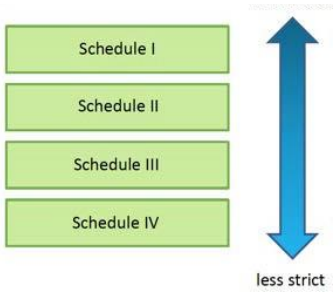
In the Preamble of the 1971 Convention the tone is radically different than in the Single Convention and in the scheduling system it changes. While in the Single Convention a substance is supposed to be dangerous, until proven otherwise, this presupposition is not systematically applied in this convention. This can be seen in a selection of sentences from the Preamble: “Noting with concern the public health and social problems resulting from the abuse of certain psychotropic substances” and “recognizing that the use of psychotropic substances for medical and scientific purposes is indispensable and that their availability for such purposes should not be unduly restricted” are “determined to prevent and combat abuse of such substances and the illicit traffic to which it gives rise.”

It is on this tone that the 1971 Convention had been written. In other words, faced with addiction and non-medical use of

legitimate medicines, the UN and its signatory parties decided to regulate psychotropic substances without putting too much pressure on the industries. Indeed, by admitting such substances should not be "unduly restricted" it became an entirely intersubjective notion which is illustrative in the framing of this convention through more flexible measures which aimed at facilitating trade.

The schedules are also separated in four sections – different from the previous - from stricter to weaker controls. [36] The WHO can recommend that a substance be placed under international control under specific criteria if it has the capacity to produce: a state of dependence and central nervous system stimulation or depression, resulting in hallucinations or disturbances in motor function or thinking or behavior or perception or mood; or similar abuse and similar ill effects as a substance in Schedule I, II, III or IV; and, that there is sufficient evidence that the substance is being or is likely to be abused so as to constitute a public health and social problem warranting the placing of the substance under international control (1971 Convention on Psychotropic Substances, Art.2(4)). Unlike the Single Convention that included control on salts, esters, ethers and isomers (their derivatives), the Convention on Psychotropic Substances initially did not contain this (Sinha, 2001:27).

Figure 4 : Schedules



UN Convention Against Illicit Traffic in Narcotic Drugs and Psychotropic Substances 1988

During the 1970s and 1980s, various national and regional drug control initiatives and drug-related discussions flourished. In

[36] The preamble was taken from the Convention on Psychotropic substances and the figure of the schedules from a conference held by the CND to the governing bodies in July 2019. The figures can be accessed through this link (accessed November 23rd, 2020): https://www.unodc.org/documents/commissions/CND/Scheduling_Resource_Material/Sc%20heduling_Control_Regimes.pdf

Europe, the Co-operation Group to Combat Drug Abuse and Illicit Trafficking in Drugs, commonly known as the "Pompidou Group" illustrates well (EMCDDA, 2019:6). It aimed at improving police and customs drug enforcement cooperation and from then, INTERPOL became an important clearinghouse for information and a sponsor in drug enforcement meetings (Sinha, 2001:33). In that climate, the Resolution adopted by the 1984 UN General Assembly requested ECOSOC to instruct the CND "to add an additional "trafficking-specific" layer to complement the two existing Conventions" (*Idem*.,).

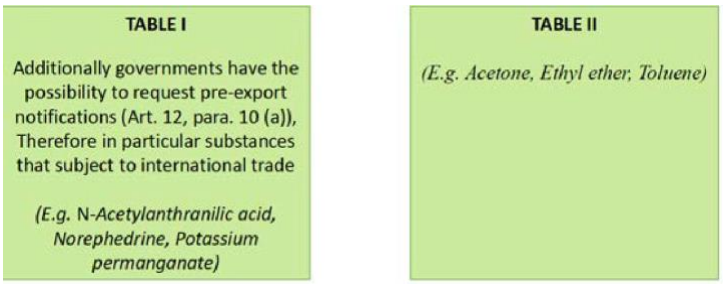
The 1988 UN Convention is essentially an instrument of international criminal law (*Idem.,*). In the Preamble, the following sentences were kept here to acknowledge the mindset of this convention: parties are "deeply concerned by the magnitude of and rising trend in the illicit production of, demand for and traffic in narcotic drugs and psychotropic substances, which pose a serious threat to the health and welfare of human beings and adversely affect the economic, cultural and political foundations of society"; they recognize "the links between illicit traffic and other related organized criminal activities which undermine the legitimate economies and threaten the stability, security and sovereignty of States", and they desire "to eliminate the root causes of the problem of abuse of narcotic drugs and psychotropic substances, including the illicit demand for such drugs and substances and the enormous profits derived from illicit traffic."

Such sentences are important in understanding how parties are willing to suppress the root cause of illicit traffic that undermines humankind and states, for social and economic reasons. What seems peculiar, however, is the objective to eliminate the root cause of such a dual commodity. As seen previously, drugs are ambivalent in their essence; therefore, eradicating them seems like an unattainable target. Furthermore, faced with the realities and the limited

capacities of the current globalized organizational industry, it appears that doing more than currently is less likely to happen.

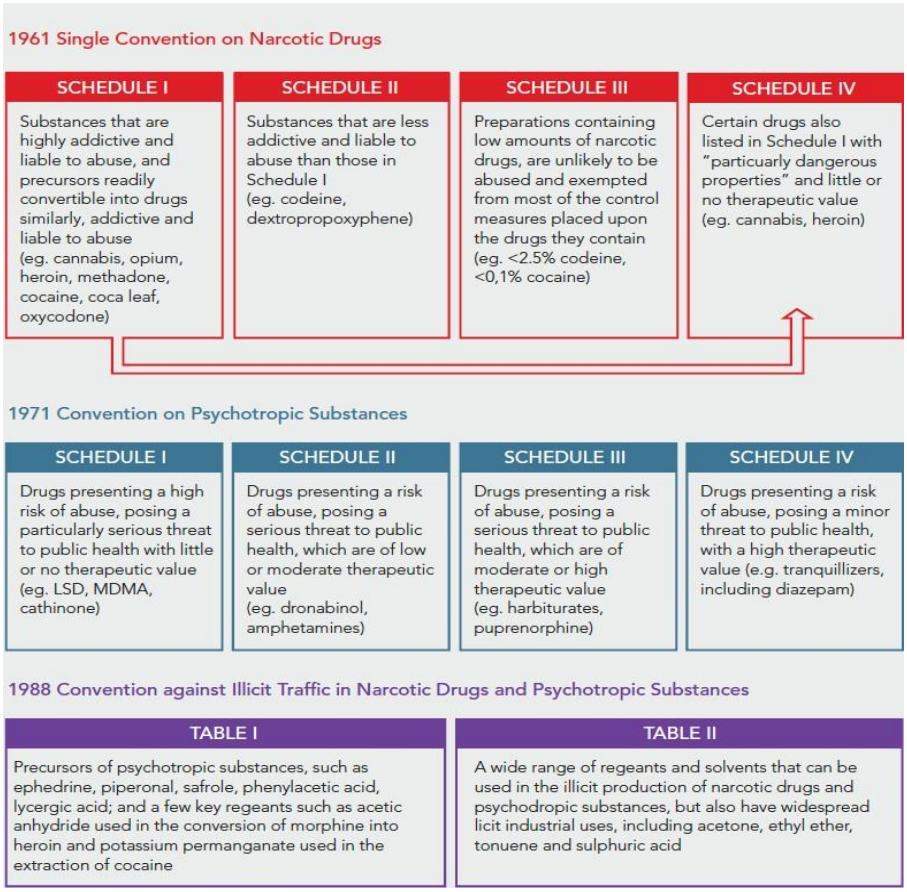
Under this instrument, objectives stated by the parties were to harmonize national, drug-related criminal laws and enforcement actions to decrease illicit drug trafficking through the use of criminalization and punishment. Parties are required to create and implement very specific criminal laws aimed at suppressing illicit trafficking (Stewart, 1990: 392-393). These laws cover money laundering, confiscation of assets, extradition, mutual legal assistance, illicit cultivation, and trade in chemicals, materials and equipment used in the manufacture of controlled substances. As with the other two Conventions, the CND and the INCB are the bodies charged with administration (Sinha, 2001:36).

Figure 5 : Tables



Two tables in the 1988 Convention describe a list of substances frequently used in the illicit manufacture of narcotic drugs or psychotropic substances, which can be revised through time, under certain criteria. For my research, the most important instrument is the Single Convention of 1961, because it focused primarily on opium. One of the biggest issues has been to reconcile the strict drug economy with the liberal nature of international trade agreements intended to promote free flow of commodities (Sinha, 2001:36-37). Figure 6 summarizes all the schedules of the international drug control regime:

Figure 6 : Schedules under the UN Drug Conventions [37]

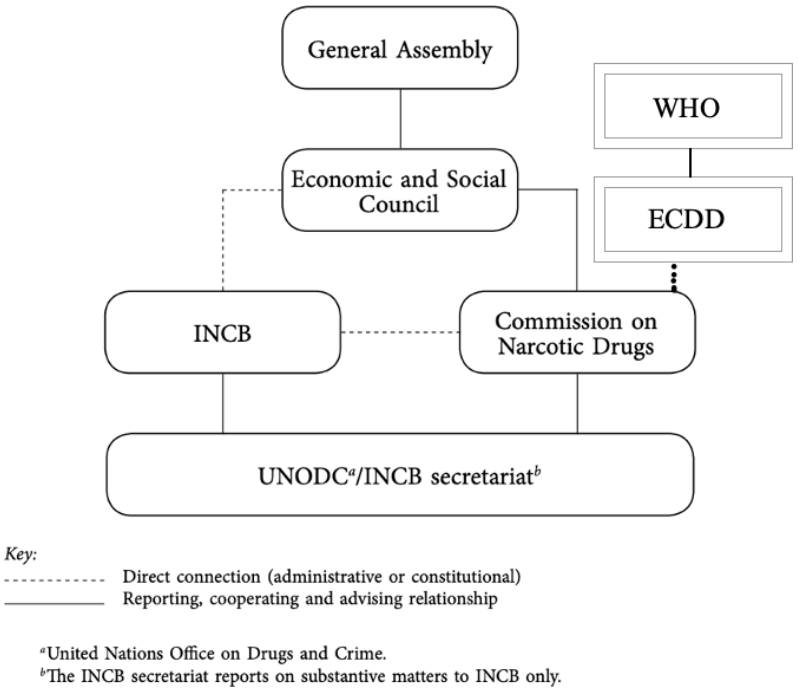


Mandates and actors

Like most UN treaty-based regimes, a number of organizational actors oversee its various aspects. There are only a few important actors to bear in mind in the UN apparatus, mandated by the three UN conventions and supervised by ECOSOC. The United Nations Office on Drugs and Crime (UNODC), the International Narcotic Control Board (INCB), the Commission on Narcotic Drug (CND), the World Health Organization (WHO) and the Expert Committee on Drug Dependence (ECDD). Let us look at them more closely in figure 7 below which shows the UN apparatus for international drug control. [38]

[37] Source: Global Commission on Drug Policy, 2019:9
[38] Taken from the UNODC website, with my addition of the ECDD and WHO.

Figure 7 : United Nations system, drug control organs, secretariats [39]



The United Nations Office on Drugs and Crime (UNODC) is an institution of the UN. It coordinates all drug and crime related activities of the UN, with a focus on administrative and technical support (Courtwright, 2012:17). They write annual reports and special issues, but mostly have a "name and shame functioning" (Tinasti, personal communication, November 2020).

The International Narcotics Control Board (INCB) was established by the 1961 Convention. Known as "the Board", it describes itself as a 'independent and quasi-judicial' control organ for the implementation of the treaties (INCB, 2020). It monitors the cultivation, traffic and use of narcotic and psychotropic substances worldwide to ensure that these activities are confined to legal purposes. The INCB publishes an annual report of its work and the worldwide situation on drugs. In order to assess this and facilitate dialogue on national drug policy, it regularly sends delegations to

[39] Source: UNODC website with the author personal addition of the ECDD and WHO

individual member states and makes estimates based on their work and the states cooperation.

Among these, the Commission on Narcotic Drugs (CND), which is the central policy-making body, has a key role. The CND consists of 53 member states and was founded in 1946. It determines the strategic goals of the UNODC and monitors their implementation. According to Article 8 of the Single Convention, their functions are the following: "to amend the Schedules; to call the attention of the Board [INCB] to any matters which may be relevant to the functions of the Board; To make recommendations for the implementation of the aims and provisions of the Convention, including programs of scientific research and the exchange of information of a scientific or technical nature; and to draw the attention of non-parties to decisions and recommendations which it adopts under this Convention, with a view to their considering taking action in accordance therewith."

Figure 8 : The UN apparatus [40]

Body	Economic and Social Council	Commission on Narcotic Drugs
Function	Discusses and analyses drug-related issues; initiates drug-related studies; drafts conventions; convenes drug conferences	Analyses drug traffic and trends; advises ECOSOC; prepares draft international drug agreements; provides forum for information exchange
Body	International Narcotics Control Board	United Nations Office on Drugs and Crime
Function	Control organ for the implementation of the drug control treaties; provides advice to the WHO; determines worldwide medical and scientific drug requirements; processes technical and statistical information provided by states; allocates cultivation, production, manufacture, export, import and trade quotas; advises status on anti-drug measures	Co-ordinates UN anti-drug activities; provides secretariat services for the CND and INCB; advises countries on implementation of the drug conventions; executes anti-drugs initiatives in host countries

The WHO has a specific technical mandate to make recommendations about what substances should be placed within those conventions. The WHO created the ECDD, which has a special mandate within the international drug control conventions, which is essentially to protect access to medicines (Dilkushi, personal communication, July 2020). "The ECDD makes a purely kind of evidence-based assessment that considers both, access to controlled medicine, and that [the substance] might have drug dependence

[40] Buxton, J. (2006). The political economy of narcotics. London: Zed Books. p.59.

producing properties, what do they actually do cause, dependence or other kind of types of misuse or abuse or digression or harms" (Dilkushi, 2020). The ECDD collaborates with the WHO in the sense that they make recommendations. Once endorsed, the WHO makes the recommendation to the CND. The CND then votes whether to accept the technical recommendations from the WHO (Dilkushi, 2020). Here below is a summary table made by the WHO on its role under the international drug control conventions.

Figure 9 : WHO in the International Drug Control Regime [41]

Limits of the international drug control

As for many international tools, limits can be drawn. Without being exhaustive, let us explore what seem the most relevant.The matter of scheduling is particularly difficult and controversial.

[41] Source: WHO website

The arguments put forward are that the scheduling is too political and lobbied by the corporate or prohibitionist ideologies, but not evidence based. For example, one of the most debated argument is that tobacco and alcohol do not figure in any conventions although they cause most of the harm. The arguments are that prohibition has implied many negative consequences on various aspects (Global Commission Drug Policy, 2014; Tinasti, 2020). While associations, non-governmental organizations, and experts in the field have pushed for a renewal of the conventions, there is evidence that reports to push re-structuring or changes in the schedules have been kept out by "institutional gatekeepers" (Courtwright, 2012:14).

In that respect, Buxton (2006:120-121) provides a selection of expert reports that have been written, were "sidelined or suppressed", with the implication sometimes of authors being dismissed (Tinasti, 2020).[42] The most recent example of this was the case of David Nutt, at the time posted as chair at the Advisory Council on the Misuse of Drugs in the U.K. government, who published an article which caused his dismissal. In 2009, he and his colleagues who resigned created an Independent Scientific Committee on Drugs (now called Drug Science) and published the findings in the Lancet (Nutt, King, Phillips, 2009). They compared harm caused by licit and illicit drugs with other than *usual* variables.[43]

For about twenty years, scientists, civil society (non-governmental organizations, associations, federations) and governments, have been mobilizing for looser control and focus towards societal and depenalization orientation. Constituting real

[42] Along the same lines, Sheila Jasanoff asks herself many interesting questions on the relation between science and public policy, specifically the way science adviser influence policy, as she coined the "fifth branch" (1998). An interesting research could be made on the role of scientific research and knowledge it plays in controlled substances. See appendix 19 for a list of expert research which were side-lined.

[43] See appendix 5– for more details on the reports suppressed and David Nutt's research.

epistemic communities,[44] they have innovated and permitted evolution, in the sense of Haas (1992:3). Some governments have drawn limits to international convention measures as they saw this concern rising above their national sovereignty right. As expressed by Steber Büchli in our discussion "the health of our people concerns us" when describing the establishment of the four pillars drug policy in Switzerland (Steber Büchli, personal communication, November 2020).

As some coin "internal tensions" in the international drug control regime (Barrett; Bewely-Taylor; Gootenberg; *et al*, 2012:49) initiatives have started in the late 1990s taking effects in the 2000s. The so-called UNGASS decade,[45] in which the UN drug control regime experienced normative and societal transformations such as with the depenalizationof all drugs in Portugal in 2004, cannabis in many countries including Uruguay, the Netherlands, medical cannabis in states of the U.S. and Canada, to state only a few.[46] Heroin-assisted treatment for addiction has flourished in certain countries, famously in Switzerland with its four pillars policy. Different policies would imply social benefits and income, butinitially fear and blockage by the international drug control regime (Tinasti, 2020).[47] Despite this, many are favoring such an orientationand broadening their horizons. One example is Russia, who passed a legislation in July 2019 "authorizing the cultivation on its territory

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[44] For Haas (1992:3), an epistemic community "is a network of professionals with recognized expertise and competence in a particular domain and an authoritative claim to policy-relevant knowledge within that domain or issue-area."

[45] "Increasingly dissatisfied with the punitive approach promoted by the conventions, a significant number of regime members engaged in a process of 'soft defection' (Bewley-Taylor, 2012:20). Rather than quitting the regime, these states deviated from its prohibitive norm, and exploited plasticity within the treaties, while technically remaining within their legal boundaries. Since norms are crucial to the essential character of a regime, such a process of normative attrition represented a form of regime transformation. Crucially, however, in this case transformation involved regime weakening and changes from within, rather than a more substantive change of the regime" (Barrett; Bewely-Taylor; Gootenber; *et al*, 2012:50).

[46] Some call the "dissensus" in drug policy, which was highly awaited at the United Nations General Assembly on the World Drug Problem (UNGASS) in 2016. (Brookings, 29th April 2015). It could also be what Haas (1992:373) describes as the process of policy evolution (innovation, diffusion, selection and persistence).

[47] A strand of governance literature has been describing the functioning of the UN especially on matters like environment, internet and food security of "multistakeholderism governance" popularized by the founder of the World Economic Forum in Davos (Klaus Schwab) or "polylateralism" by Geoffrey Wiseman.

of opium poppy plants for the purpose of extracting alkaloids. More specifically, the new law allows for the cultivation […] and the processing of poppy straw for the purpose of manufacturing pharmaceutical or veterinary preparations containing these opiates" (INCB, 2019:98). This announcement echoes the growing willingness in narrowing the dependence on other states, becomeself-reliant and have a part in the international trade of categorized essential goods.

In the UNODC World Drug Report executive summary 2020, the UNODC call for a "balanced, comprehensive, effective response to drugs, while being health-centered rights-based and gender-responsive approach to drug use and related diseases deliver better public health outcomes" (World Drug Report, 2020: Preface). Even more recently, the CND voted on a highly anticipated and much delayed decision to reclassify cannabis from schedule IV of the UN Single Convention, to stop it from being as strict as like heroin (UN news, December 2nd, 2020).

This chapter lays the institutional groundwork needed to understand the international regime in controlled substances. It also paves the way for me to answer my second research question, which I will return to at a later stage but repeat here: what is the role of the UNODC in the regulation of the critical nodes of controlled substances used for medicines? For now, let us continue with my case study, natural opioids. This will then allow me to examine the critical nodes in the global production network of opiates.

CHAPTER IV. OPIOIDS

The legal business of plant-based medicine

In order to respond to the first research question, i.e., the critical nodes of the global production network, it seems crucial to first explain how the legal business works based upon my research and interviews. The first part of this chapter will be dedicated to definitions. I will go over the definition of pharmacology and its purposes and objectives, then move on to the definition of medicine and its different nexuses. I will then explain what narcotic drugs are and we will learn to distinguish opiates and opioids. I will then outline what opium alkaloids are and evoke a distinction between opioid medical and non-medical use. The second part of the chapter, I will explore the business of opiate medicines, from poppy field cultivation to delivery (consumption). I will outline the unique characteristics of this industry by mapping out the key playersspread out globally, focusing on the most important ones in each segment of the supply-chain processes. Moreover, I will help readersoverview the scale of the business by providing information from databases of this commodity's international trade. While some sections might seem unnecessary for the purpose of this study, it is extremely important to cover this basic knowledge. Most of the specific literature, be it books or academic articles, only tends to

focus on one aspect or the other. It is either aimed at experts in the scientific side of the topic (pharmacology, criminology), or public policy (global health, international relations,economic) or industries (logistics, economic, R&D), all of which are specialized in one specific area.

What is pharmacology?

Pharmacology is an interdisciplinary branch of medicine that mixes biology and chemistry, commonly called "the science of drugs". As seen in the contextualization part, *pharmaco* comes from Greek – *pharmakon* – poison/remedy, and logy from *logos* – the study of. Its fields of application cover everything from the development of medicines to their use after they have been put on the market. This science includes various disciplines such as pharmacokinetics, pharmacodynamics, clinical pharmacology, experimental pharmacology, pharmacovigilance, pharmaco-epidemiology and even pharmaco-economics. All of these sub-disciplines are specific in their study.[48]

The founding father of pharmacology is considered to be Pedanius Dioscorides, a Greek physician who wrote his famous book between 50-70 C.E, the first pharmacopoeia,[49] *De materia medica*, describing the preparations, properties and testing of drugs and medicinal preparations. This book has been read and used for more than sixteen centuries and made crucial contributions to what we know of pharmacology today. Already in his text, he clearly

[48] I will not detail each of them here but will briefly explain what I think are the most important regarding my research. Pharmacokinetics (PK) is the quantitative study of the four phases of a drug's development in the body: absorption, distribution, metabolism and elimination, so it describes the drug concentration-time courses in body fluids resulting from administration of a certain drug dose. Pharmacodynamics (PD) is the detailed study of how the drug works. It combines with any receptor, enzyme or cell structure to induce the pharmacological response. It is the observed effect resulting from a certain drug concentration. Pharmacovigilance aims to detect, evaluate, understand and prevent adverse effects that may occur during the use of a medicine in a population after it has been placed on the market. Every single pharmaceutical industry will have a department of pharmacovigilance in their infrastructure, as it constitutes a crucial component of this industry, especially for its viability (Meibohm and Derendorf, 1997).

[49] Pharmacopoeia today are published by legitimate authorities or governments.

refers to opium preparations for sleeping potions as a surgical anesthetic (Saleh, 2001). This example highlights the traditional importance of opium in its uses in the medicine field over several millennia.

What are medicines?

The WHO defines a medicine as any substance or composition presented as having preventive or curative properties with regard to human or animal diseases. It is any product that can be administered to humans or animals with a view to establishing a medical diagnosis or to restoring, correcting or modifying their organic functions (Saleh, 2001).

The functions of medicines are twofold: therapeutic and diagnostic. Therapeutic use is more common and can be preventive, as for example vaccines, and/or curative; etiological; substitutive or for symptomatic purposes. The diagnostic function, on the other hand, is used for exploration and includes opacifiers, tracers, and various pharmacodynamic agents. The effects of medicines are usually classified by their therapeutic effects (therapeutic efficacy, favorable effect, beneficial effect, or clinical effect) and their adverse effects (notorious, secondary and toxic). There are different origins of fabricating medicines, which can be classified as followed: vegetable (plant-made), animals, synthetic, biotechnological/biogenetic, microbiological and mineral.[50] While the focus here is on plant-based medicine, it will also be necessary to discuss synthetic origins for the case of opioids.

[50] Vegetable (whole plants or parts of plants such as mint) or extractant after purification as in alkaloids (morphine, quinine). Animals (organs, glands, tissues). Active ingredients obtained after extraction, especially hormones and enzymes. Synthetics (complex molecules obtained by organic chemical synthesis methods or by the transformation of already known molecules). Biotechnology/biogenetics (by genetic engineering methods - manufacture of natural polypeptide substances that have characteristics of their human model (hormones, cytokines)). Microbiological: vaccines from bacteria or viruses and sometimes certain antibiotics. Mineral (natural mineral products used as active ingredients or excipients for medicines (e.g., water, talcum powder, sodium bicarbonate, magnesium sulphate)) (Saleh, 2001).

A typical drug is composed of an active ingredient (known as active pharmaceutical ingredients) which is a substance endowed with therapeutic properties. It supports the pharmacological activity of the medicine. In order to form a medicine with active pharmaceutical ingredients, through what is known as the formulation process of medicine manufacture, other compounds are used, which are referred to as "excipients." An excipient is a substance, or a mixture of substances called auxiliary substances, inactive by themselves, which facilitate the preparation and use of medicine. An excipient can sometimes have adverse effects, but usually the most neutral one is chosen and used. The excipient is particularly important when choosing a drug delivery system in the formulation process. Drug delivery systems are engineered technologies for the targeted delivery and/or controlled release of therapeutic agents (Drug Delivery System, 2016). Therefore, the selection of one type over another in a drug delivery system will influence the form and efficacy of the medicine. A drug can either be sub-lingual/oral (tabs/pills/sprays), transdermal (patch), rectal (suppository), subcutaneous (intramuscular, intravenous), intrathecal/epidural (cerebral spinal fluid), intranasal and iontophoresis. This is important to keep in mind as some security considerations might come to play when choosing a drug delivery system[51], other than pharmacology or economic factors. For instance, in the U.S. or in Switzerland, to avoid dependence and hinder access to certain drugs, the form of the delivery will differ depending on the client/patient. Hospitals will usually have soluble medicines for their inpatients whereas outpatients would be given

[51] It is interesting to note that strategically thinking of an effective drug delivery system is not only reserved to licit markets. In illicit markets, they also consider the form of a drug for its efficacity and traceability. It can arise from traffickers or consumer willingness. However, the reasons will be different. Traffickers will prefer forms for transport security, and consumers for purity and effectiveness of the drug. The latter was seen for the case of heroin in the 70s. Previously smoked or sniffed, due to a reduction in quality, consumers started to heat it and inject it, therefore changing the practices of this niche. Many considerations arose, especially with the HIV epidemic, and public policy had to adapt in order to contain the number of infections.

oral pills. This means that soluble medicines make diversion in hospital settings less probable. However, it would be incorrect to consider that this is the only reason. Costs and practicability are also important factors, as well as cultural values, as certain countries prefer one form over another (Schild, personal communication. October 7th, 2020).

Medicines as a whole must respect three requirements: safety, efficacy and specificity. These requirements can be found in any pharmaceutical industry manufacturing or creating drugs, and typically a priority in pharmacovigilance (Schild, 2020; Anonymous, 2020).

Regarding the naming of medicines, there are different names used depending on their different applications. Firstly, the scientific or chemical name is usually in accordance with international nomenclature but often too complicated to be used in daily practice. Secondly, the International Nonproprietary Name (INN) gives each active ingredient a standard name that can be used in all countries. The INN has been created on the WHO's initiative, and is used by the UN apparatus, and sometimes other industrial actors. Thirdly, there is the commercial name: this is the brand name registered by the manufacturer, which is generally written in capital letters. And lastly there is a commodity code, the Harmonized System (HS) which was proposed initially by the WCO and is a multipurpose international product nomenclature used in international trade (WCO, 2020). Such varieties of nomenclature make enquiries and research particularly difficult and time consuming.

Even though these names are instruments put in place to facilitate and make international trade more visible, to exhaustively grasp the range of medicines produced from a plant is extremely difficult and perhaps even impossible. For this research, diverse databases were examined to acknowledge the scope of opium-based medicines. This will be discussed at a later stage of this work.

How is it relevant for us?

One of the biggest ills in today's world is pain. The number of people suffering from chronic pain is estimated to be extremely high, up to 40% of the population worldwide, being the "first reason why adults seek medical care" (Dahlhamer; Lucas; Zelaya; *et al*., 2018: 1001). Chronic pain "has been linked to restrictions in mobility and daily activities, dependence on opioids, anxiety and depression, and poor perceived health or reduced quality of life" (Schappert; Burt 2006; Smith; Elliott; Chambers; *et al.,* 2001; Greje; Von Korff; Gater 1998; in Dahlhamer, Lucas, Zelaya, *et al.,* 2018: 1001). Thus, addressing opioids is extremely relevant.

Different medicines are available for pain-relief, depending on their type and intensity. The use of pain assessment tools with a variety of scales helps provide more customized treatment. Physiotherapy and other kinds of therapies may also be used. In the field of pain management and treatment, pain is more and more approached through a systemic perspective as the body and mind's responses result from a complex variety of variables. In terms of medicines used in order to ease pain, the kind of pain - whether acute, chronic, nociceptive (which can be acute or chronic and either visceral or somatic) or neuropathic - will impact the selection of the type of drug, delivery and dosage. [52] This means that certain drugs willbe preferred for types of pain, and here enters the crucial roleof narcotics.

[52] For instance – different types of pain killer drugs used. Usually, there are gradual approaches to the type of medicine depending on the level and origin of pain. Although criticized for good reasons, the WHO issued guidelines "the three-step analgesic ladder" (WHO, 1986) for pain management medicines. Based upon the principles 'by mouth', 'by the clock', 'by the ladder', 'for the individual' and 'attention to detail' – they help physicians choose one drug over another and select timing. The types of medicines are the following: paracetamol, NSAIDs (nonsteroidal anti-inflammatory drugs) typically ibuprofen or aspirin (both over the counter) and prescribed: corticosteroids, nerve blockers or anti-depressants, and opioid analgesics (codeine, morphine, and synthetic opioids – fentanyl, oxycodone etc. See appendix 6 to see the WHO three-step analgesic ladder.

Narcotics originally comes from the Greek word *narkōtikon* meaning stupor, making stiff or numb.[53] It was then used in French and referred to a substance which induces sleep and blunts the senses (Narcotics, 2020; DEA, 2020; UNODC, 1956). Though some people associate narcotics to illegal drugs, today narcotics connote directly to opium, opium derivatives, and their semi-synthetic substitute. It is important to note that these substances are not prescribed or used in the same way throughout the world. It depends on the culture, practices and availability as well as the quality of medicine.[54] Finally, when it comes to pain relief, the aforementioned substances are part of the analgesic group of drugs. Analgesic drugs act on the central and peripheral nervous system and allay the feeling of pain, without causing loss of consciousness. On the other hand, antalgics – for which the terminologies are often used interchangeably – refer to counteracting pain.

This leads to the need to distinguish between opiates and opioids – both being the most potent narcotics and analgesics available. Opioids or opiates likely sound familiar to the reader. Their similarity is that they are both analgesics and bind to opioid neurotransmitters. But general misunderstanding in the terminologies lie in the topic whenever it is brought up in discussions. This is why I will take the following sub-section to go over it, but also the important features to keep in mind when discussing opiates.[55]

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[53] Narcotics can be analgesics (pain killers), hypnotics (sleep inducing), sedatives (soothing), anesthetic (inducing unconsciousness). The line between the four is not clearly drawn (UNODC, 1956).

[54] In a limited number of countries, diamorphine medicines (methadone) are found for the treatment of heroin dependence. The availability of this medicine goes theoretically against the U.N. conventions, but it is assumed by such states that they understand better their domestic needs, usually more liberal in their approach to drug control, and the use of methadone has shown positive results on patients. Also, another synthetic opioid antagonist can be used in case of opioid overdose, namely naloxone. Such medications have had specific studies regarding their diversion in hospital facilities and ambulatory treatment. This will be more explored at a later stage.

[55] Even if there are "official" resources, the resources are not exhaustive and it is not transcribed to the reality, as much heterogeneity is found in practice throughout the spheres. One particularly telling resource in terms of multi-names can be found in the "Multilingual dictionary of precursors and chemicals frequently used in the illicit manufacture of narcotic drugs and psychotropic substances", transcribing names and chemical structures of the

The differences between opiates and opioids

One should note that many different theories and definitions exist around the opiate and opioid distinction. Extra care needs to be taken as in some situations it is still not used properly, even in medical practice. Detailed research made it possible to specifically differentiate them. The main difference between the two are that: "opioids" represent a popular, most use term referring to any substances – natural, semi-synthetic, synthetic – which bind toopioid receptors and produce opiate-like effects. It is possible to findthat to certain people this word might only mean synthetic substances. On the other hand, "opiates" derive solely from the opium poppy plant, usually the *papaver somniferum* (and sometimes *papaver bracteatum)* from which many alkaloids are then used in medicine manufacture. Therefore, opiates are opioids, but not all opioids are opiates.[56] A figure was made to illustrate the differencesat the end of this section.

To compare morphine to a synthetic opioid, morphine is one of the strongest natural substance and also the oldest in practice. A synthetic opioid in comparison, fentanyl or oxycodone – identified as fueling the opioid crisis for the last twenty years – is a hundred more times potent than morphine (drugbank, n.d.). This contrast implies much reflection regarding dosage, availability, diversion and counterfeit-falsified of such substances. Indeed, it is much easierto create a synthetic medicine in clandestine laboratories than by accessing raw narcotic material, in any forms - opiate alkaloids, opium paste, or concentrate poppy straw.[57] In this case, one would need some precursors and basic chemical and biological knowledge in order to counterfeit synthetic medicines. Another difference between the two is that morphine figures on the essential medicine

substances. The link to access it: https://www.unodc.org/documents/scientific/2019-%20MLD_Precursors_supplement-ebook.pdf

[56] Please see appendix 21 for a table of human use of opium compared to other opioids.

[57] In the industry section, terminologies will be better explained terminologies at the industry level (opium alkaloids, narcotic raw material, opium paste, opium resin, opium gum, concentrate of poppy straw, opium derivatives).

list, the EML. This list was created by the WHO to work towards the availability and access to essential medicine throughout the world, but also facilitate access to generics, after patents would expire, thus providing greater and cheaper medicines. In addition, one often debated issue is the inequal diffusion of essential drugs, mostly located in the Global North.[58]

Other features in opiate that should be covered are that they are part of plant-made pharmaceuticals (Sil; Jha, 2014), for which their active pharmaceutical ingredients are called "alkaloids" (Bézanger-Beauquesne, 1958). Alkaloids are defined as "any of a number of medicinally active compounds produced by plants; alkaloids are often active in small amounts and toxic in large amounts; well-known alkaloids produced by plants include caffeine, codeine, morphine, nicotine, quinine and strychnine" (Segen's medical dictionary, n.d.). For instance, in opium, a debatable number of alkaloids are found, ranging between seven to fifty. In medicine manufacture, six in particular are used, either because of their medical value and/or their economic benefit. The six main ones are morphine, codeine, thebaine, papaverine, oripavine and narcotine. However, their concentration will depend on the plant, even though they usually originate from the same root species, *papaver somniferum*.

The situation nonetheless becomes more complex as one considers that "a number of other "opium alkaloids" are commercial products and are used medically, but they are not obtained directly from opium, but by conversion of morphine, codeine and thebaine" (UNODC, January 1st, 1953).[59] This is due to chemical conversions, and from this point, an unaccountable number of derivatives can be

[58] Please see appendix 7 for three graphs on the distribution and availability of consumption of opioids.

[59] It seems important to note that even in the expert fields, terminologies can differ as can categorizations. So, for example, morphine might sometimes be considered as a natural and other times as semi-synthetic substance. The same applies in different ways for all substances and alkaloids.

made. For example, using thebaine as a base, one can obtain oxycodone, a semi-synthetics opioid broadly consumed today.[60]

A last consideration should be made at this stage. One may ask whether it is possible to synthetically create morphine, or any other opiate alkaloids, without the raw narcotic material (i.e., opium)? This question is relevant because it could engender serious political, economic, and structural implications throughout the sector and in the diversions, illicit practices and activities denoting one process over another. Much research and development (R&D) activity has been undertaken in order to create a better cost-efficient solution and ready-made one.

Two studies are particularly important: one is to transform "sugar-to-morphine", commonly glucose to morphine, and the other one uses "brewer yeast" to morphine (Galanie; Thodey; Trenchard; *et al*., 2015; Oye; Lawson; Bubela; Maynard; 2015). From the researcher's perspectives such transformation would have many benefits. Firstly, it would be safer, as no residue would be left in the final commodity – as reliant from raw material; and it would please fervent believers in the national economy, as they would no longer need to rely on foreign essential commodities, therefore allowing the industry to flourish from within, and fixing a "broken globalized supply chain" as shown by the COVID-19 pandemic (Smolke, July 16th, 2020). From an economic perspective, this would reduce most of the many uncertainties in crop yields (DeLoache; Russ; Narcross; *et al*., 2015) such as the weather, climate change or pests; but above all, an alternative more cost-efficient and generating better value. However, in a perspective of world-system theory, this could well be catastrophic given the current transnational distribution of labor, the success of such technologies would mean profound restructuration throughout the plant-based pharmaceutical industry, affecting all its currently players, benefiters and losers, it would

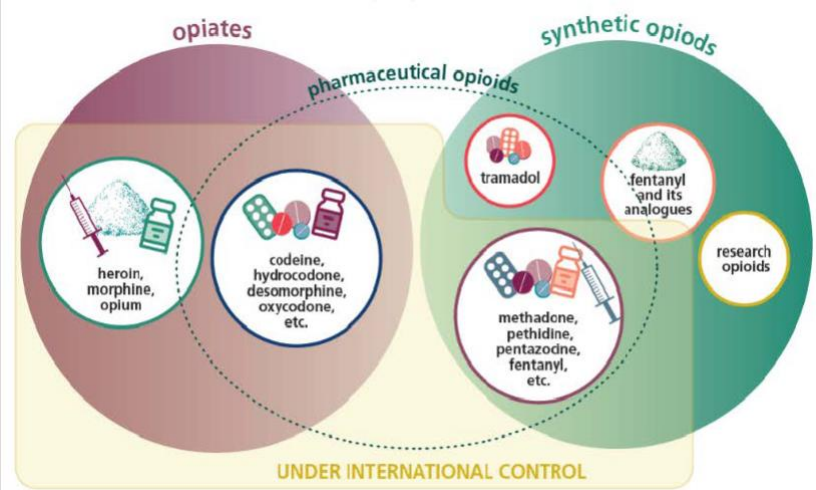
[60] One should also note the use of opium cultivation for other purposes than medicine such as in the food industry (poppy seeds, poppy oil).

redistribute many cards. This could well be what Schumpeter coined as *creative destruction* in 1942: an appearance of innovative technology, creating chaos, before rebuilding other perspectives- similar to a newborn phoenix arising from its ashes.

But such a scenario is not yet the current reality, in spite of twenty years of progress in that direction. Potency has not yet reached commercial standards, and research is continued to reach them. It is nonetheless important to address developments and research of this nature, as the COVID-19 pandemic has addedweight to arguments around self-reliance in essential commodities, outlining fragile global supply chains in general, but also in pharmaceuticals being of utmost importance. Such research might well change the whole global production network.

The medical and non-medical uses of opioids

Figure 10 : Opioids for medical and non-medical purposes



The graph above describes the medical and non-medical purposes of opioids. It is striking to note the highly normative stance from an official source, the UNODC in the World Drug Report 2019. Indeed, one can correctly see the distinction between opiates and synthetics opioids. However, two misconceptions can be observed.

The first, and most important, is the circle for pharmaceutical opioids. It does not take into account heroin, morphine and opium

although they are used in pharmaceutical opioids. Opium, morphine and heroin (in some countries) are prescribed and used, and for the case of morphine, it is the most widely administered substance in the medical field. This is extremely important to point out, as it illustrates quite clearly the level of misinformation, which is prevalent regarding controlled substances, an area of conflicting specialized knowledge. The position of some key players (medical authorities and official actors working in the international control apparatus) involves misinterpretations. This converges with some of the interviews I conducted (Anonymous, 2020; Schild, 2020). When discussing whether heroin was a legally manufactured substance, medicine, the response was negative. However, it is, and can be in certain circumstances. This current confusion is noteworthy, particularly as all my interviewees can be considered – and consider themselves - as experts in the field: scientists, doctors, regulators in the international drug regime, law enforcement in controlled substances or drug policy analysts.[61]

The second misinterpretation in figure 10, above, lies in the denomination "under international control." Indeed, fentanyl and its analogues are under international control as are most research opioids. The interview with Prof. Schild, the Titan group DEA and the ECDD all stressed the difficulties for researchers to access opioids for research purposes. Even for minimal quantities, the criteria can be extremely rigorous, and the waiting list can be up to several years. In this respect, from the interviewees' perspectives, it can be quite detrimental to have such weight for insignificant quantities.

[61] An interesting perspective is Cetina's work on epistemic cultures. As she described, the term culture is often applied in many fields but when it comes to knowledge not. In order to analyze it, she says "one needs to magnify the space of knowledge-inaction, rather than simply observe disciplines or specialties as organizing structures." I tried to implement this in the thesis, to extract knowledge culture societies in order to bring out a deep understanding of this broad topic (1999:3).

One highly debated issue should also be addressed here. Once a substance is put under international control, it becomes very difficult to determine who can prescribe it. This was an issue particularly in the Global South countries in which nurses are the primary care givers, but also often the first to prescribe medicines. For a substance to figure both in the international control schedules and on the essential medicine list can bring complications in implementation or in practice. In fact, to ascertain whether a substance is under current control or not, one must consult the yellow list published every year by the INCB (Yellow List 59th edition, INCB, n.d.).[62]

To conclude this section, it would not be an understatement to say that legal and illegal, at least when it comes to opioids, are not distinguishable categories. Fortunately, this statement is not only mine but shared by many others. As an example, my e-mail exchange with Medicrime, a branch of Swissmedic, describing medicrime as "the umbrella term used by Swissmedic for all national and international activities to combat medicinal product-related crime" (Swissmedic, n.d.) can confirm it. To my questions: "*do you believe legal and illegal activities are distinguishable*" and "*do you think there are nodes in the global supply chain that favorize illicit activities*" they went further and responded by the affirmative "*yes*" (Medicrime, personal communication, December 3rd, 2020). The following section will thus examine the industry and attempt to identify these nodes, as well as the power that might be exercised in such a situation.

[62] All the lists can be found here: https://www.incb.org/incb/en/narcotic-%20drugs/Yellowlist/yellow-list.html last accessed on November 17th, 2020.

Figure 11 : Summary of the technical aspects covered

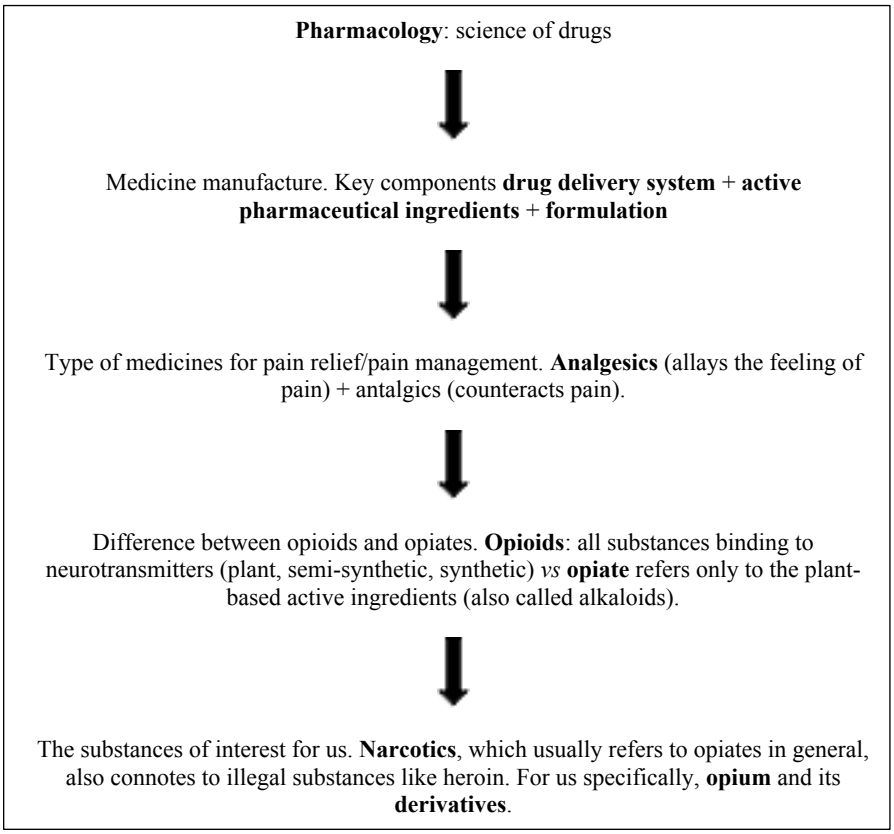


Figure 12 : Examples of plant-based (natural), semi -synthetic, synthetics opioids

Plant-based/Natural opioids/opiates	**Semi-synthetic* (opiates)**	**Synthetic opioids (only chemicals)**
Opium	Heroin	Fentanyl
Morphine	Hydromorphone	Methadone
Codeine	Hydrocodone	Tramadol
Thebaine	Oxycodone	Meperidine

It seems important to mention that semi-synthetics are not clear categories. For instance, to make heroin, one needs a chemical named acetyl anhydride (also called acetic anhydride), a necessary precursor. From opium gum, from which morphine can be extracted, with a mixture of compounds and chemical process, one can obtain heroin. Due to this process, heroin is considered as semi-synthetic. Thus, any individual with minimum equipment can transform itfor many different utilities.

CHAPTER V. CRITICAL NODES IN THE GLOBAL PRODUCTION NETWORK OF OPIATES

From poppy fields to opium trade

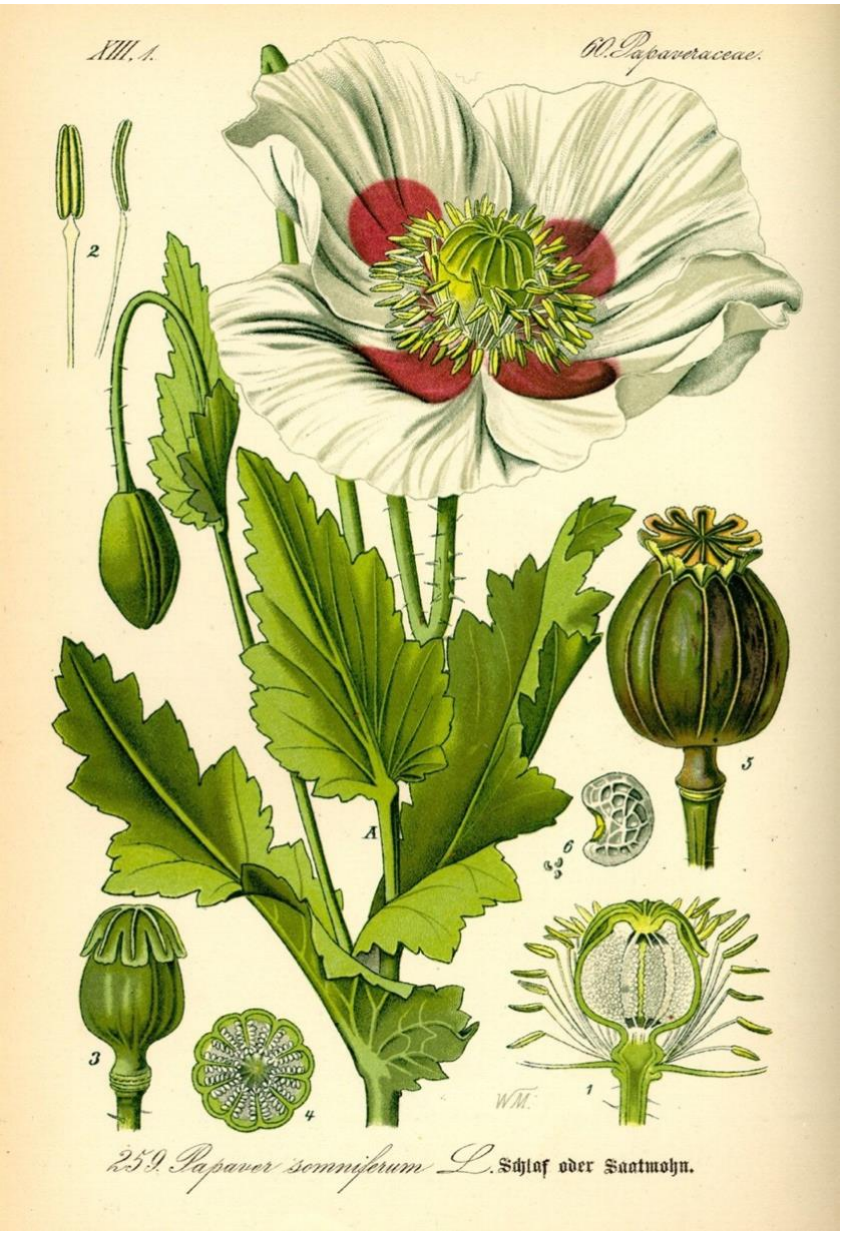
In this chapter I aim to respond to my first research question and identify the critical nodes in the global production network of opiates. As a reminder, critical nodes in this work are interpreted as microcosms within a network in which value can be created, captured, transformed, or logistically transported; they are considered as crucial because of their role in the supply-chain and in their potential of being exposed to illicit practices such as diversion. This definition takes into account the actors and objects involved in those specific nodes, requiring that the actors and objects (such as regulatory instruments) involve a combination of logical perspectives which can be subject to change over time. Global production networks of opium also describe a global multiscalar network of licit and illicit economic and noneconomic actors, through licit and/or illicit practices, behaviors, sometimes coordinated, but from which actors are implicated in the specific industry.

To identify critical nodes, I will focus on the global supply chain of opium as a commodity. I will first explain and analyze how opium is cultivated and harvested. Then I will move on to the international trade of the commodities. This is important as it will show routes and give insight into the traceability of opium as a good, as well as featuring the actors involved in these various steps and the critical node location and forms. I will discuss in more detail the last critical node identified, and the end of the supply-chain, illicit practices in consumption. Finally, I will put forward several observations on the global production networks focused on the industry of opiates.

The methods of opium harvests

When examining the global supply chain of opium, and institutional documents, what becomes clear is the debate regarding the choice of method used for cultivating and harvesting this commodity. It appears that the choice of method is politically argued. Either for parts of traditions and domestic economic dependency, or for economic and security efficiency.

Figure 13 : A drawing of the opium poppy (papaver somniferum)[63]



The traditional harvesting method

A unique characteristic of opium is that it can grow nearly anywhere if the climate is clement enough. The plant used is generally *papaver somniferum* or *bracteatum*. Usually, fields are secured in such a way as to avoid diversion, but this practice is questionable. Space does not allow for a detailed description of

[63] Thomé, O. W. (1885). Flora of Germany, Austria and Switzerland - in words and pictures for school and home. http://www.biolib.de/ accessed on December 28th, 2020.

cultivation, but I will focus on two methods to harvest poppies: the *traditional* method *vs* the *industrialized* method.

The traditional way to harvest is to vertically scratch off opium poppies capsules (seed pod) with a sharp scraping tool so that the milky latex it contains oozes out. Once the latex dries out and becomes dark, the semi-dried gum is harvested with a curved trowel and then left into a bigger recipient for it to dry completely.[64] Once the gum is dried, this is what is called resin or gum and its trade commodity's name is usually opium sap.[65] The opium sap is then traded around the globe (its legal side is mostly concentrated in four key regions: Asia, North America, Europe and Tasmania). It is usually with this base that alkaloids are then extracted to formulate medicines with an added excipient. Other than for pharmaceutical use, the opium sap can be consumed in some places for traditional/cultural reasons, often by smoking opium.[66]

The traditional method used to be the one chosen by all "traditional suppliers' countries" – mostly located in the so-called *Global South*.[67] For example, under the UN Single Convention (1961), India is the sole country authorized to produce and export opium gum. A practice well-documented in scholarship, to produce and export opium gum, implies the use of the traditional method (CBN website, 2020). However, this method also has some disadvantages. It is said that India has a unique status. "It is a sole licensed exporter of raw opium" (solid 90% content for UNODC) as a final product to the pharmaceutical world but also one of the biggest consumers, and the third largest producer of illicit opium (after Burma and Afghanistan) (Paoli *et al*, 2008: 347).

[64] See Appendix 8 for pictures of the traditional harvest method.
[65] For an example of what opium sap can contain, a figure on Indian sap is provided in Appendix 9.
[66] The popular way to describe one's smoking opium is "chasing the dragon". The root for this expression is debated but seems to have emerged in Asia.
[67] However, Turkey has passed to the industrialized method, and India is slowly adapting parts of its industry in the industrialized method.

Indeed, this method has been described by the Central Bureau of Narcotics (CBN) in India - which oversees cultivation and trade in legal opium and comes under the finance ministry— the lancing as a "skill acquired by years of experience... the depth of incision (by sharp blades) an accomplished, precise art" (Bera, Sep 8th, 2017). This method has advantages since it is *traditional* it involves historical ties to this type of agriculture and agronomics - and thus employment and rural activities are implicated for these resources, and value is extracted, even though the value is less than the manufacturing itself. It also means that countries such as India are to some extent dependent on this niche market for their economic and societal economic well-being. The most important aspect for this research topic is the proportion of diversion that can arise fromsuch a system. Although great effort has been devoted to prevent such behaviors, it is also a well-documented, everyday practice.[68] This method would then constitute the identification of one of my first *critical node*. This critical node has different facets. Its culture and harvest, until its transportation to refineries. I will turn into the diversion practices that are current in this method now.

A first priority for opium as a tradable commodity, and of utmost importance for this controlled substance due to its potential abuse, is to prevent diversion. Diversion, as explained above, "is the theft of opium at any point along regulated production and distribution lines" (Windle, 2012:56).

Tracing back opium as a commodity in the perspective of a global production network has allowed me to highlight the types of diversion that can happen. Thus, the cultivation and harvest of poppies through this method is the first critical node and is characterized by various illicit practices. In spite of employing

[68] Please refer to appendix 10 for an illustrative one-page extract of an official document produced by the CBN in India, of de-licensed cultivators in one facility based in one region, for the year 2020-2021. What is striking is the section "reason for de-license" – and "theft/missing capsule" being predominant in the page extract. The other reason is "MQY-M below 4.2". This refers to the minimum quantity yield of the plants containing mostly morphine alkaloids, a minimum quantity imposed by the CBN.

research articles, interviews, and my own investigative research, working on diversion can be complicated as the data available is solely based on official seizures made public.

To prevent diversion from happening,[69] divisional offices estimate the average yield produced in each village. This is a politically lobbied process[70] and has to be linked directly with the black market as being "congruent to licensing – since opium farmers are able to produce significantly more than they had been licensed to" – a practice that has been taking place for some time now (Carnac, 1866 in Windle, 2012). The estimation is called "MQY", an acronym meaning "minimum quantity yield", with a number variables taken into account, such as the field condition, climate, past harvests, quality of gum; overall making an estimation of the minimum quantity yield on which the cultivator agrees in delivering such a result after the harvest.

Diversion can already start before the cultivation of poppies. Indeed, in order to farm poppies, one need seeds. Obtaining seeds usually requires an official route, having to register and provide some information in order to buy them. Once purchased, however, there is room for diversion at this early stage and it is extremely difficult to control the right usage of seeds. This is due to countless factors such as not having the number of poppies initially mandated. It is possible to resell seeds to the illicit market, farm the seeds directly for the illicit market on unknown lands, or farm the seeds to feed personal cravings.[71]

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[69] Other tools are used in detection and prevention of diversion such as satellite imagery and money retribution.

[70] The setting of MQY is highly politicized. The opium lobby (opium farmers, political patrons) if not happy can mobilize, and have in the past (US Department of States, 2005).

[71] What led me to think it could be a critical node is that the official website of the Central Bureau Narcotics in India has a section in which they require specific documents for the registration and import of poppy seeds. This fact strongly suggested that illicit practices must happen at this stage already. For the document details please see: "List of Documents to be submitted for grant of Registration for import of Poppy Seeds" or "List of Documents to be submitted by first time importer of Poppy Seeds" at https://cbn.nic.in/html/opiumcbn.htm (accessed on 15.12.2020). Another factor is the prohibition of selling poppy seeds in Taiwan (for exactly this purpose – out of fear of people growing poppies). This thought is therefore supported by others than me. In other countries, poppy seeds can be prohibited for their content in morphine (making false positive drug

According to Paoli and her colleagues (2009), diversion in Indian's licit poppy fields can occur in four additional ways. Firstly, cultivators may plant additional hectares without the proper licenses; secondly, cultivators may claim falsely that licit growing is not harvestable and sell harvests illicitly; thirdly, a proper licensed and harvested field might yield more than the minimum quantity and the unreported excess can be sold illicitly; and finally, diversion can arise after the purchase from the government due to corrupted agents selling out the government inventory (Paoli *et al,* 2008: 349).

In addition to these diversion methods, India is the only country that permits opium gum extraction and its export rather than "poppy straw concentrate" which is less prone to diversion. A fundamental trait then is that "diversion is a routine and openly tolerated activity and, to a certain extent, even promoted by local cultural norms and social structures." (Paoli *et al*, 2008 :349), coming from the corruption of elected village headman known as the Lambardhar, who work for the government and have to record daily yields of opium from the cultivators. Indeed, agreeing with the studies conducted by Mansfield (2000, 2001), Lambardhar has a key role in the diversion process. By making false declaration and the practice of turning a blind eye they directly take part in diversion of crops, through means of benefits in return.

The traditional method has been criticized since accurate estimates of the minimum quantity yield (even if it is high)is crucial to the success of licit production, but it is also more prone to diversion and superintendent of police have even gone as far as saying: "I strongly think the government should put an end to open cultivation and make way for captive farming by pharmaceutical companies" as "leaving the task of extracting the opium gum to farmers opens the door for illegalities" (Bera, Sep 8th, 2017). The concentrate of poppy straw method as used in other countries is more

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test results), such as in Singapore or United Arab Emirates for example. The selling of poppy seeds will be explored at a different critical node later.

secure. But having a high minimum quantity yield can result in other illicit practices in order to meet the minimum harvest contracted and not be de-licensed for the year after the farmer purchases the shortfall, illegally, from a neighbor whose yield is higher for a large sum of money (Bera, Sep 8th, 2017).

This critical node explored above could well be applied to other countries applying this method, although techniques might differ. However, it seems striking that licit and illicit are intertwined. In the case of India, might it be through diversion practices, or the source of opiates to be found, there is blatantly illicit domestic cultivation, while its geopolitical position makes imports from Afghanistan and imports from Burma possible, and the diversion from licit production.[72] "Illicit opium is most, produced domestically under licit auspices" (Paola *et al*, 2008: 348). Many justifications can be put forward, but one is overriding: the money farmers receive from licit and illicit sources is incredibly different and therefore an economic necessity (*Ibid*., 352). The analysis should not end here; indeed, when looking at the big picture, the linkbetween India being the pharmaceutical center of the South, significant manufacturer of medicine, and the counterfeit of medicine is clear and has also been confirmed by some of the interviews conducted (Medicrime, 2020).

Finally, to close the loop on the traditional poppy field critical node, one must visualize this subject as a puzzle. The production and commerce of opium poppy is not solely focused on opium, but also has by-products. Such by-products, for example poppy seeds, are then sold for culinary purposes. These seeds come from the same poppies and have morphine content, they could be the source to potential future illicit harvests (Carlin; Dean; Ames; 2020).This can be linked to my earlier point about the registered seeds needed in order to farm opium poppies.

[72] Please see appendix 11 for a table on the steps in opium cultivation to heroin manufacture process, how with only a few chemicals and material, one can make heroin.

Nonetheless, from the occidental perspective, pointing out to India's particular case is political bargaining, to the same extent as pointing out Afghanistan as a nearly exclusive illegal source of opium and heroin (Tinasti, 2020). Many more participate, but Afghanistan is most discussed. Indeed, it is political as in India the industry is state-owned but has inherent structural flaws which enables a fully diversion-free industry. Whereas industrialized countries are proud of their most effective method when it comes to speed, effectivity and control (UNODC, 1956) - are also prone to diversion. The main difference is that this diversion is much opaquer, and pharmaceutical industries are responsible of their actions and misdoings working in a mixed environment of trust and mistrust. Let us explore this now.

The industrial harvesting method

The industrial poppy straw process of harvesting consists of using the dried whole poppy capsules with the straw (Breger Bush, 2020: 8). Then the dried poppy is processed into a crude extract referred as "narcotic raw material" and is flown to manufacturing facilities (Pacific Standard, July 24th, 2019). In these facilities, alkaloids are extracted, then referred to as "concentrate of poppy straw" (CPS) or if more refined, "opium alkaloids and their derivatives". Usually, such a method does not involve human labor as such, but mostly machinery for the whole process.

The advantages of this method are that is it much more cost-efficient, as the input is less, compared to the output, (human labor vs machinery and time), and is less prone to diversion practices. It is less prone to diversion as the whole plant is used towards the extraction of alkaloids. This method is particular to pharmaceutical purposes whereas, as said above, the traditional method has various purposes, including the selling of by-products coming from the poppy plant.

It should also be mentioned that in the industrial method of poppy farming, over time, the plants have been genetically transformed in order to perform better in their hold of active ingredients. This means that *papaver somniferum* or *papaver bracteatum* can have a distinctive yield potentiality in their content. In the field, the different types of plants from which alkaloids will be extracted are denominated as "*papaver somniferum/*CPS (M), (T), (C), (N), (O)" (INCB, 2019: 145).[73] The letter in brackets indicates the main alkaloid prevalent that will be extracted.

This method is usually used by "non-traditional suppliers", mostly located in the *Global North*. Eleven countries are listed to legally produce and sell narcotic raw material and use the concentrate poppy straw (CPS) method: i.e., Australia, Austria, France, China, Hungary, the Netherlands, Poland, Slovenia, Spain, Turkey and Czech Republic. However, the countries involved in cultivating poppies can vary regarding sources. Sometimes Belgium, Brazil, Canada, Denmark, Japan and Luxembourg figure as well (UNODC, 2019:34), as do Macedonia, Democratic Republic of Korea and Japan (Williams, 2010: 304).[74] For most of these countries, the industrial production of opium poppies has been a process over the years as crops might have been cultivated for hundreds of years prior, for food or other reasons, as for the case of Hungary when it begun its commercial morphine opium poppies production (UNODC, 1953).

I was able to identify potential critical nodes in the industrialized method.[75] I will take the case of Tasmania as an example. As Williams (2010) explored in his article with the theoretical framework of deconstruction, Tasmania has an ultra-

[73] (M)= Morphine; (T)= Thebaine; (C)= Codeine; (O)= Oripavine.
[74] In the following section I will explore the data I have collected with the list of countries enumerated to see if it coincides. As for the list of countries involved, the specific method is assumed to be industrialized but clear data could not be found.
[75] it was nearly impossible to find anything on the production, manufacture and commerce of the commodity – in all its forms. The main reason is due to opacity and information deemed confidential.

modern manufacturing process – and can be examined "as both isolated (insular by definition) and connected (globalized)" (Williams, 2010: 290). Tasmania "has often provided up to half of the world's supply of licit narcotics each year" (*Idem.,*) and counts for a significant part of its economy. Tasmania plays on its "islandness; drug free, geospatial- law-abiding" (*Ibid.,* 297) and meanwhile it is an international success, with significant levels of output and technological innovation, it is yet "shrouded in mystery" (*Ibid.,* 291). This tendency for the industry to be covert arises because its commodities are "not ordinary merchandise" (Wood, 1988:149). Although the narcotic raw material can vary in types and strengths from the various producing countries and counterparts, I would suggest that the process from opium poppies to medicine is very similar, and therefore, the critical nodes too.

Although there might be specific characteristics to one's territory, it seems like general patterns can be attributed to this type of industry overall. As Williams said, deconstruction can be a"useful tool for interpreting such discursive silences and duplicity, and it has a specific relevance in this context" (Williams, 2010: 292). How opium is referred to – or omitted – in addition to the opacity and secrecy englobing the industry greatly reveals the inner workings of the business, the rules of the game between the playersand its link with domestic and international regulations. Obfuscationis intended as it minimizes enormously the potentiality of one to familiarize with the topic and research it. It creates an extremely complex system that no one can understand fully and therefore leaves power to be exploited by the actors who know how the business work and its possibilities.

Further evidence of intrinsic political processes in the making of regulations is the 80/20 rule, adopted in the 70s by the U.S. (one of the largest consumers in the world) (DEA, 2008: 1312). They decided to buy 80% of their morphine from Turkey and India – a rule still in place today. Turkey has been considered as a

traditional country, open to illicit crops and had important incentives to convert illegal production into legal. Over time, they changed their method to concentrate poppy straw (CPS) as in the past they were using the traditional method. At the time, the U.S. saw a political advantage in letting Turkey doing so, as it would halt the "spread of communism as a heavily Muslim country that had warm relations with Israel" (New York Times, July 19th, 2014).

This is the context in which GlaxoSmithKline and Johnson and Johnson (Business Standard Report, March 4th, 2015), at the time in competition in this type of industry in Tasmania, exploited a regulation loophole. Indeed, the substances regulated concerned certain strains of opium poppies, and through genetic engineering, these companies were able to syntheses the *papaver bracteatum* (Washington Post, March 26th, 2020), deadly if consumed from the fields[76], and high in thebaine content (one of the alkaloids). This was the premise of oxycodone, and the exportation into U.S. soils in great numbers, as no regulations had been placed on thebaine. This "allowed for a decades-long boom in licit opioid production fueled by Tasmanian-grown poppies" (Pacific Standard, July 24th, 2019). This opened a market in the U.S. and was exploited by the pharmaceutical industries, which then undertook general malpractice from them into the medical practice by sponsoring congresses and the sale of this new –non-addictive— medicine, which resulted in over-prescription and high numbers of addicts which is still the case today (Financial Times, June 19th, 2020; Brookings, June 22nd, 2020). Industrial manufacturers do exploit possibilities in order to grow and have better opportunities in their market shares. Although highly moral and directly linked to the

[76] On diversion practices, newspaper articles can be informative. In a few articles, there have been reports of death resulting from the ingestion of opium poppy capsules in Tasmania. Indeed, the opium poppies cultivated in Tasmania can be highly dangerous if consumed as is and several people have died resulting from the theft of these (ABC, September 19th, 2013; Worldwide Waftage, January 4th, 2017; ABC, May 9th, 2017). In response to the thefts and deaths, the Tasmanian Justice Department has asked to place a death danger sign outside the facilities.

health of the people, it remains a business striving for profit, in which illicit practices can come to play. This phenomenon that I have just described could be considered as a critical node.

Other potential critical nodes may exist, as mentioned earlier, for the traditional method in the seeds in order to cultivate poppies, but mostly at the initial stage. Otherwise, diversion can occur at different steps, such as diverting parts of the harvests, the chemical used in the process (which can then be sold and used in the illicit market), proportions of the narcotic raw material itself, and diversion when it comes to inventorying and transporting the substances. Another important concern, especially for illegal trafficking is the use of internet. One can think that internet can be a tool for which to pass merchandise or communicate in diversion of licit production too. These types of diversion not only feed the illicit market but also individual substance dependences.

In fact, forensic and chemical studies show that the heroin found in Tasmania and Australia is of the same chemical compounds as that of the licit production in controlled facilities.[77] With techniques in order to determine the origin of heroin, scientists were able to identify the signature compound of this substance, with oripavine, present in the *papaver bracteatum,* for thebaine. This important study reinforces the fact that diversion does happen, even in licit facilities using the industrial method, and in the Global North (Odell; Skopec; McCluskey, 2008). However, it is unclear whether one can fully accept this study as a reliable source, or whether it is a case of researchers being pressurized. An erratum has been formulated from the industries and Tasmanian officials at the express wish of the Tasmanian Poppy Advisory and Control Board (PACB) saying it does not "accurately reflect the current state of the Tasmanian poppy industry". What is certain, however, is the

[77] The only company I am referring to is Extractas Bioscience – formerly known as Tasmanian Alkaloids. They changed their brand name in 2020. Their website: https://extractas.com.au/expertise/alkaloid-raw-materials/ accessed on the December 16th, 2020.

historical thefts of flower pods and their potential to be transformed into heroin (Odell; Skopec; McCluskey, 2008).

The critical nodes in the industrial method are much more difficult to point out compared to the Indian case and much opaquer and lobbied. When interviewing retired pharmaceutical employee, he told me: "everything is done to prevent. It depends obviously on the country and the matter but most attention is driven on counterfeit drugs, and wholesaler, depending on the matter. Usually there are one or two bottles of diversion, but we use special seal and lot numbers so we can detect anomalies easily." He continued by saying that in such an industry "there are no such thing as business as usual" and that there is always something.

Another predominant feature that illustrated my interview was the importance of the environment of distrust amongst all actors involved. Pharmaceutical industries are subject to regional laws in addition to other international differences. For instance, to my question "do you know all actors involved in this business" he responded: "yes, it is our responsibility. Products are registered in one country and the mistake would be excessive – in cost and jail. In the European Union there is the QPPV[78] – which means that the responsibility is on the person and not the company." This kind of industry is costly, risky and highly competitive, with many variations between small and big companies, with many facets around it, making the entire business incredibly complicated. It has been said that from a government or regulator's point of view, it is under a climate of trust and mistrust that business happens (Anonymous, 2020; Schild, 2020; Medicrime, 2020). A number of tools developed in the industries prevent diversion from happening, including contents being sealed, lot numbers and expiry dates inventories, fully computerized systems with sophisticated software in which everything is calculated. Clearly, it would be far too

[78] Qualified Person Responsible for Pharmacovigilance (QPPV). This protects the company by making responsible the person in charge.

difficult for regulators to verify all the compliance to regulations. Therefore, companies have this flexibility to themselves undertake such compliance, and possibly be controlled at a later stage, by an external compliance body. Regulators do trust pharmaceutical industries in the sense that they should comply with regulations, but regulators do not fully trust pharmaceutical industries in the sense that they have to put forward regulations and sometimes control it. It is also interesting to note that for regulators or businesses, it is in their interest that behavior is up to standards as it would otherwise badly reflect on their reputation. As my interviews with Prof. Schild, Ms Steber Büchli and the retired pharmaceutical employee exposed, pharmaceutical industries have absolutely no gain to turn into illicit sources for their business. If they want to be viable, they ought to control their sources properly.

Furthermore, during my interview with the Titan Group DEA, the response to my question "are businesses usually compliant with the current regulations?" was that "every one of them [they had visited] were never a hundred percent compliant." The percentages of incompliance thus leave room for malpractice. The whole supply chain is supposed to be on a "closed loop distribution" meaning as it leaves the manufacture until its distribution, nothing should slip out. Nonetheless, as theft occurs in manufacturing facilities, one canfind shipments with unexpected addresses, stolen by different means. This is why other tools are used, depending on the country, to track down the good until its consumption. What is interesting tobear in mind, is that for instance in the U.S. it is based upon trust that companies should follow their own compliance. If they notice something unusual, they can contact the DEA, or other companies that will look into their compliance system. Apart from the DEA's occasional random audits, compliance is to the responsibility of the business itself, and whether or not it is possible to be "diversion-free", the interviews I had suggested different responses, a few

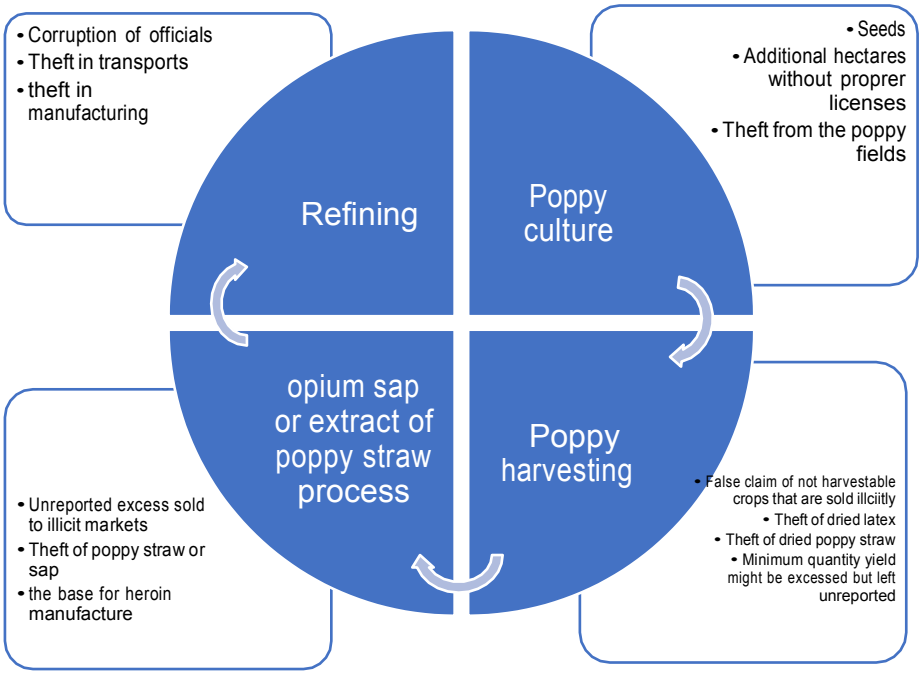
agreeing but most understanding that this is part of the business, and impossible to fully eradicate.

Finally, what is important to understand here is that the responsibility of diversion in any kind of harvesting method is borne by the country of origin of the cultivation. This means that internationally speaking, all actors accept that what has to be controlled happens in their territory. In terms of international trade, it is a commodity like any other controlled one. It is not to anyone's advantage to have a supreme authority that would oversee the entire global trade.

Figure 14 : Summary Traditional vs Industrialized method

Traditional method	**Industrialized method**
Poppy fields à scratch off poppy pods à milky latex àdries out à "opium gum/sap/resin"; poppy seeds harvested.	Poppy fields à drying of the whole poppy à dried poppies processed into extract or powder known as "narcotic raw material"; poppy seeds can be used.
Opium sap goes to centralized refineries and then to pharmaceutical industries throughout the world. This will be refined and finalize into "opium alkaloids".	Narcotic raw material is flown to manufacturing facilities, which is then referred to "concentrate of poppy straw" (CPS) and more refined, "opium alkaloids".

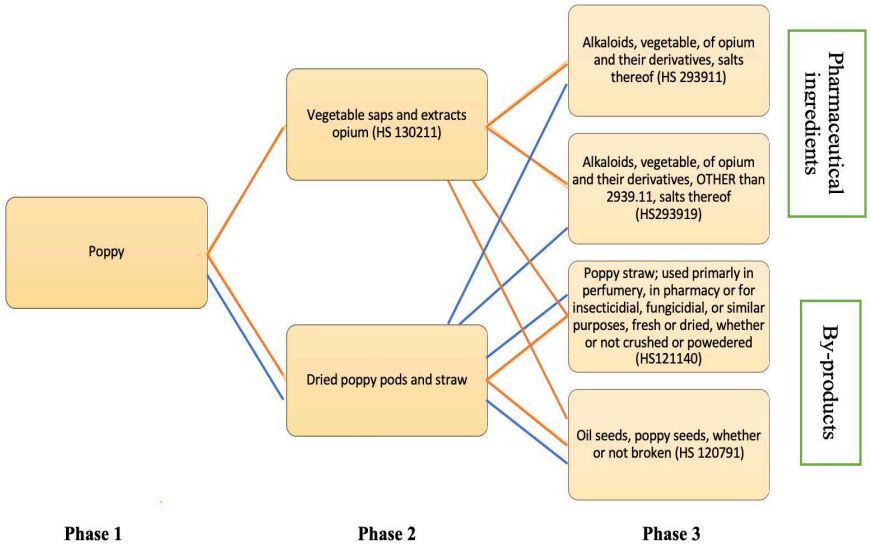
Figure 15 : Critical nodes identified in the first phase



The international trade

The names of the trade

Figure 16 : Graph of the identified forms of opium as commodities [79]



Blue line: industrialized method; Orange line: traditional method

In order to further grasp the critical nodes in the licit channels, it is important to understand the forms opium can take as a commodity. This kind of thought provides information on who-does-what-when. It is also useful as to provide data on the global trade of opium, and its derivatives as it enhances how opium is *captured* in the international trade. I will thus describe below how this commodity is coded internationally in the context of international trade and substance control.

The World Customs Organization (WCO) created a "multipurpose international product nomenclature […] which comprises more than 5,000 commodity groups; each identified by a six-digit code, arranged in a legal and logical structure and is supported by well-defined rules to achieve uniform classification.

[79] Made by my own understanding on the diverse form opium can take, and how it is referred to in international trade, including the methods of cultivating and harvesting. There might be other forms of opium poppy that are sold, but within my research, I was only able to confirm these forms. "By-products" are considered to be by the market, but in fact they are really not. Poppy seeds can be used for poppy cultivation (and make the loop from seeds to poppy again) and poppy straw is what is primarily used as the trade code for then the extraction of alkaloids.

[It] is used by more than 200 countries and economies as a basis for their Customs tariffs and for the collection of international trade statistics. Over 98 % of the merchandise in international trade is classified in terms of the HS (Harmonized System)" (WCO, n.d.).[80] Thus, this instrument is particularly useful to order international trade and helps to provide some clarity in all the forms that one commodity can have.

The Harmonized System is organized is twenty-one sections, and I base the following on the latest edition, 2017. A new and accepted form will be enforced in 2022, but no changes appeared for the case of opium. Within the twenty-one sections, there are different chapters within which categories are referred as "heading" and each commodity has a six-digit "HS code". For opium and its by-products, it had four appearances, in three different chapters, meaning that opium has four forms by which it can be traded.

The first occurrence is in the chapter 12, (WCO, 2017) title: "Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder" with the heading 1207 "other oil seeds and oleaginous fruits, whether or not broken" the HS code 1207.91 "Poppy seeds" appears. Poppy seeds are considered as by-products of the licit opium production. Those are traded for food consumption but also the opium poppy cultivation. As discussed above, one can presume a critical node in this form of commodity as diversion could occur, for example, for illicit cultivation of poppy crops.

The second occurrence is in the same chapter (WCO, 2017), heading 1211 "Plants and parts of plants (including seeds and fruits), of a kind used primarily in perfumery, in pharmacy or for insecticidal, fungicidal or similar purposes, fresh, chilled, frozen or dried, whether or not cut, crushed or powdered" under the HS code 1211.40 "Poppy straw, fresh or dried, whether or not cut, crushed or

[80] In appendix 12, a list of the countries and organizations applying the Harmonized System is provided.

powdered" figures. The purposes of poppy straw are not entirely clear, but as said in the heading, it can be used for different aims. However, poppy straw can be diverted into illicit ends, as it can be consumed as itself and transformed into illegal heroin. The latest news checked on this practice can be found on December 8th (GK news; December 8th, 2020; Daily Excelsior, December 8th, 2020). The difficulty here is to have a controlled substance that has legal by-products partially regulated but opened for other industries – a big issue also present in the precursor regulation debate.

The third occurrence is in "section II (WCO, 2017): vegetable products", chapter 13: "lac; gums, resins and other vegetable saps and extracts", for a heading: "13.02 Vegetable saps and extracts; pectic substances, pectinates and pectates; agar-agar and other mucilage and thickeners, whether or not modified, derived from vegetable products." For which opium figures in the list and has the HS code: 1302.11. One should be attentive as in one note it is stated that "(f) Concentrates of poppy straw containing not less than 50 % by weight of alkaloids (heading 29.39)"[81]. This form is thus mostly used for pharmaceutical process in the alkaloid transformation. This type of commodity can be consumed and also diverted into illicit ends.

The fourth occurrence is in section VI (WCO, 2017): "products of the chemical or allied industries", in chapter 29: "organic chemicals", heading 29.39 "alkaloids, natural or reproduced by synthesis, and their salts, ethers, esters and other derivatives", opium appears with the HS code 2939.11 as: "Alkaloids of opium and their derivatives; salts thereof : Concentrates of poppy straw; buprenorphine (INN), codeine, dihydrocodeine (INN), ethylmorphine, etorphine (INN), heroin, hydrocodone (INN), hydromorphone (INN), morphine, nicomorphine (INN), oxycodone (INN), oxymorphone (INN), pholcodine (INN), thebacon (INN) and

[81] Chapter 13 is provided in appendix 13 with the important parts highlighted.

thebaine; salts thereof."[82] To add another complexity, just further below, HS code 2939.11 refers to "Alkaloids; of opium and their derivatives; other than in 2939.11, salts thereof". It should be clarified here that it has been impossible to find more explanation as to what it includes specifically.[83] However, there are costly explanatory notes and materials that can be purchased on the WCO website, that may possibly explain what the "other" refers to. This product relates to the part in the global production chain of formulation of the medicine. This usually happens internally. It is less probable that diversion occur but remains possible that it occasionally happens, in small quantities.

It should be added that the INN mentioned after the substances in 2939.11 refers to the international nonproprietary name, created and coordinated in the 1950s by the WHO. Confusion is prevalent. In a document written at the WCO to correlate the Harmonized System with other conventions in place, it is said that the INN comes from the WTO. Although in the document itself, it is said to be not considered as an official source as it is mentioned on it, it shows the level of confusion that prevails, but also the complexity of the whole system. Indeed, the WTO had a Pharma agreement in 1994, which is, actually different and has different purposes.[84] The only mention of INN in the WTO Pharma agreement[85] is that the names of pharmaceutical active ingredients are made with a combination of different nomenclatures. The combinations involved are HS codes, product description, Chemical Abstract Service codes (CAS) and

[82] Please see appendix 14 to visualize chapter 29 with highlighted parts.
[83] I attempted to call and email the WCO, but I was unable to obtain results. Notwithstanding what they contain or describe, it shows only a limited transparency and certain power exercised over the knowledge made public, and the one, limited to the actors who can pay. It also shows that only implicated and direct actors usually use and pay for such material, and for anyone to do research on it, it is time-consuming and nerve-taking. This, therefore, constitutes one of my limits for the data I wanted to present, as I will not know what 2939.19 refers to.
[84] See appendix 15 for the illustration of the confusion.
[85] The WTO Pharma agreement was born from the Uruguay Round, part of the GATT to eliminate/reduce tariffs on specific sectors. In 1994, since then they have reviewed it four times, last being in 2010, they decided on specific products to be concerned. What is specific with this multilateral agreement is that it is the parties who directly signed by and applied were groups of participants rather than all WTO members (WTO, n.d.).

INN (WTO, 2020). It should also be mentioned that the Chemical Abstract Service codes (hereafter "CAS") is commonly utilized. It is a division of the American Chemical Society which sources chemical information and has various databases and printed until 2010 Chemical Abstracts on many substances and tools. It seems that for industries, what is used is the HS and CAS, whereas for international organizations and regulators, the INN is preferred. It is therefore a mixture of all those instruments described above that is in practice among the actors when it comes to controlled substances, and directly for our research object, opiates.

In addition to the four commodity's polymorphism in which diversion practices can occur, another independent factor arises: the transportation of these goods.[86] The techniques might differ but can be summarized in general patterns. These goods are distributed by air, sea, land travels, using planes, ships, cars/trucks. The global logistics of these goods involve domestic and international trade. A large mix of journeys are made from one poppy to a medicine. Between the steps there might be key transshipment hubs in which smuggling practices happen, from the moment it leaves one node of the global production network to another. Now that we have seen how the international trade of this commodity works and identified the critical nodes, let us delve into the countries involved andanalyze official lists of importers and exporters to determine whether any patterns are visible.

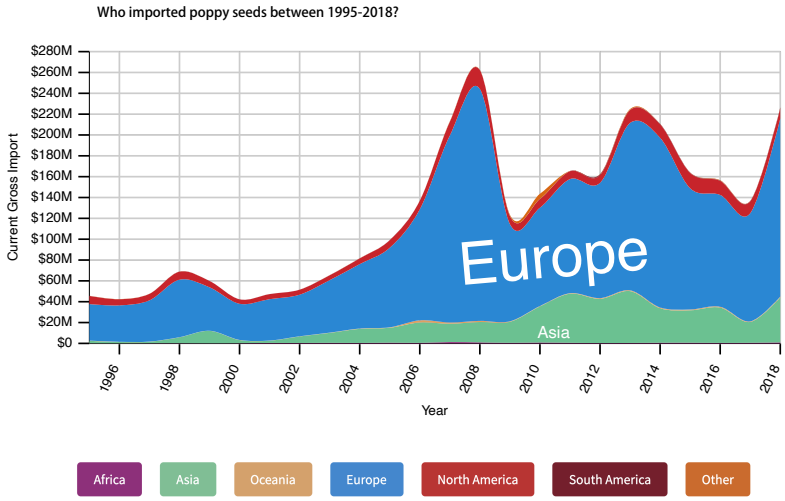
Data on opium's international trade

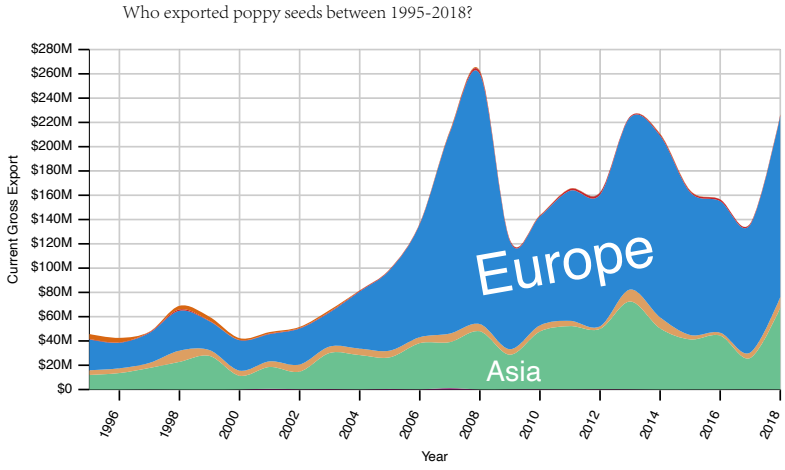
This section is limited to the availability of information, i.e., on the commodity HS 1207.91 (poppy seeds), HS 1302.11 (opium) and HS 2939.11 (opium alkaloids and its derivatives). Regarding the database used for the other three commodities, nothing was found on the opium poppy. However, on UN Comtrade there was mention

[86] Transportation in the supply chain includes land traffic (vehicles, trains, postal services), international air supply chain; maritime supply. Through them all applies for the licit supply chain (and in diversions) and the illicit supply chain.

of it (HS 1211.40). It should be mentioned that these data (from Harvard database) come from an aggregation of IMF and UN Comtrade. For the last 20 years, it has been a business of an average of $120M, mostly located primarily in North America, Europe, Asia and Oceania.[87]

Figure 17 : Import-Export poppy seeds between 1996-2018

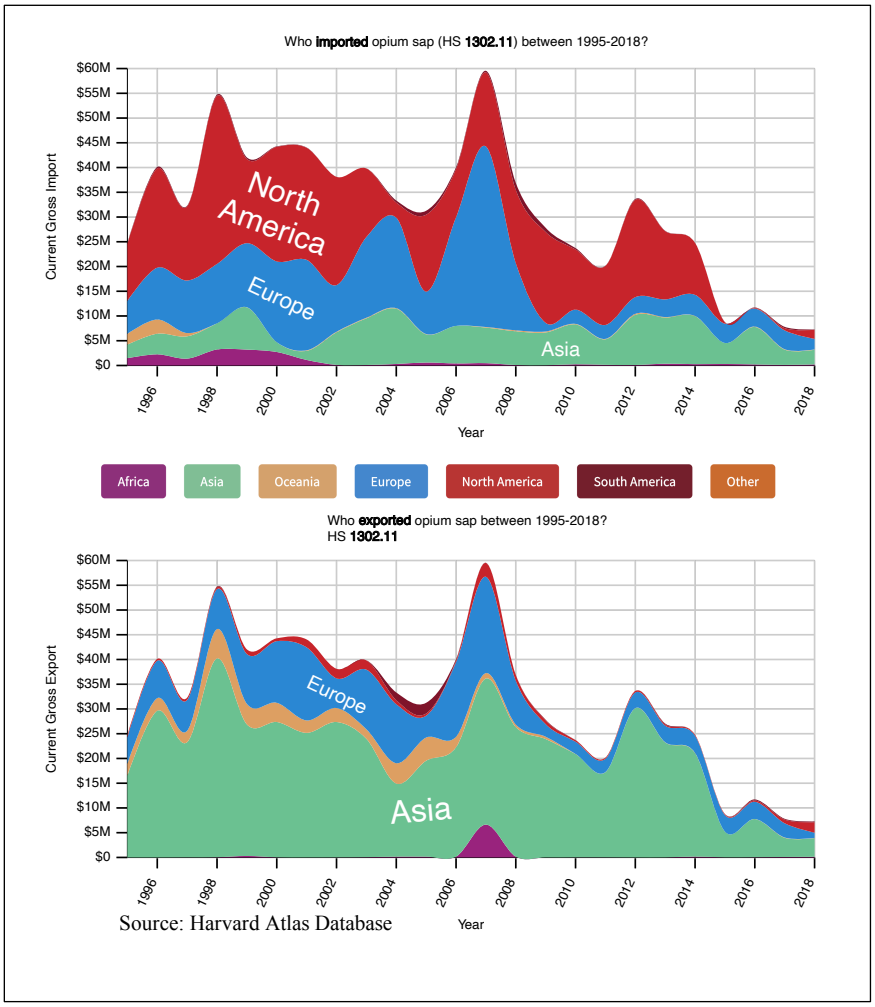




[87] Please see appendix 16 for other graph detailing the countries specifically – the biggest exporters in 2018 are Czechia, Turkey, Netherlands, China, Slovakia, Hungary, Poland, Australia, France, Spain, Austria and Germany. On the other hand, the biggest importers in 2018 are: India, Russia, Germany, Poland, Netherlands, Austria etc. These results can correlate with the critical nodes identified but also the trade flows per segments of the supply chain fragmentation.

It seems that the countries involved are the same as for other opium commodities but vary in proportions. What it shows most importantly are the countries exporting poppy seeds, which must have opium poppies at home, licensed or unlicensed, properly controlled or not.

Figure 18 : Import-Export opium sap 1996-2018



On the second graph on opium sap, what is particularly interesting is the predominance of Asia, Oceania, Europe and North America inexporting opium sap. The importing data shows that most of the transformation of opium sap is made in the Global North and whilemany regions can grow opium poppies, not all do import this commodity.

Regarding the poppy straw, I gathered data from the UN Comtrade database. It is a list, that I have cleaned, of the imports-

exports for 2018. The countries involved are mostly the same as mentioned earlier, with some new players. The biggest actors seem to be Australia, Belgium, Ghana, Greece, Hungary, Portugal, Slovakia, South Africa, North Macedonia and Afghanistan, either in imports and/or exports.

Figure 19: Import-Export Poppy Straw 2018

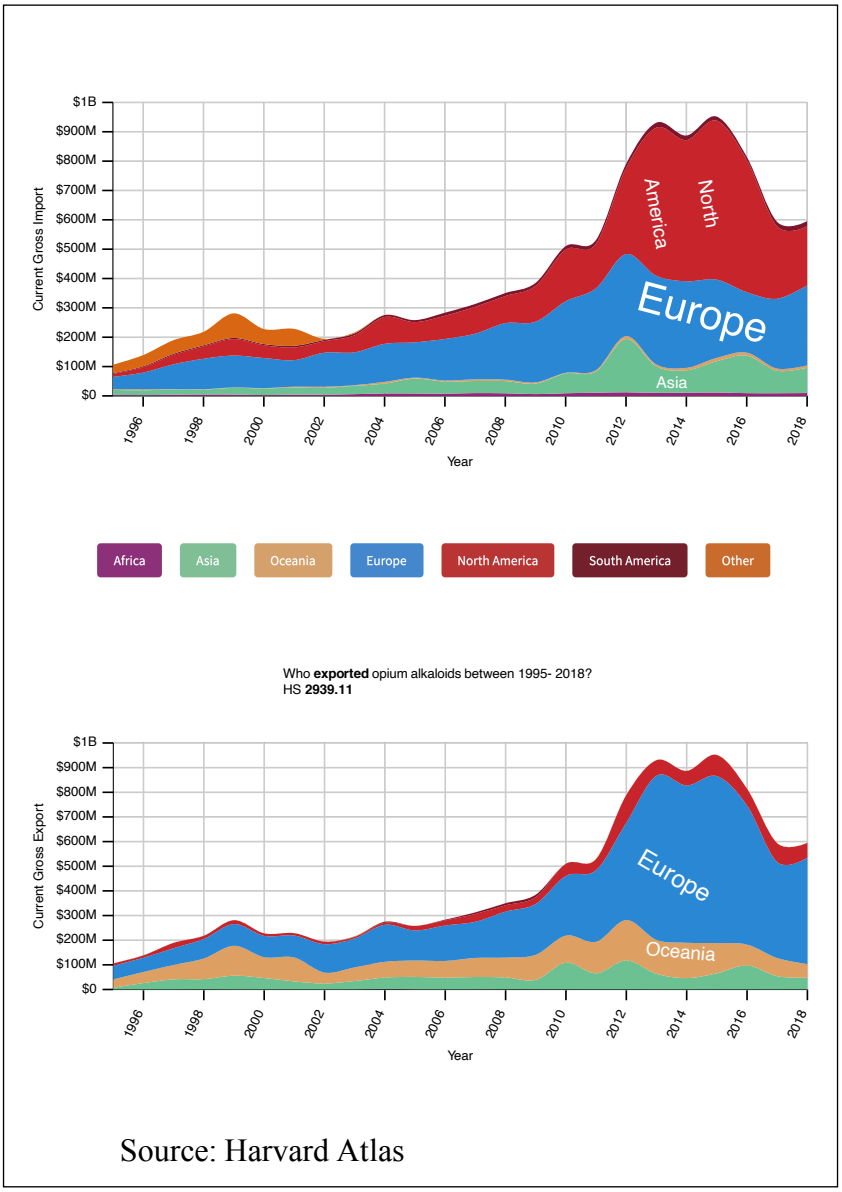
Year	Trade Flow Code	Trade Flow	Reporter	Partner	Commodity Code	Qty	Netweight (kg)	Trade Value (US$)
2018	1	Import	Andorra	World	121140	16	16	78
2018	1	Import	Australia	World	121140	894420	894420	1754013
2018	2	Export	Australia	World	121140	626801	626801	98087
2018	2	Export	Austria	World	121140	2277	2277	15952
2018	1	Import	Belgium	World	121140	626801	626801	277939
2018	1	Import	Canada	World	121140	3	3	64
2018	1	Import	Finland	World	121140	942	942	7400
2018	1	Import	France	World	121140	53		8
2018	2	Export	France	World	121140	1899		2406
2018	2	Export	Germany	World	121140	337	337	2276
2018	2	Export	Ghana	World	121140	18350	18350	3012
2018	1	Import	Greece	World	121140	577600	577600	40907
2018	1	Import	Honduras	World	121140	21	21	31
2018	1	Import	Hungary	World	121140	2	2	30
2018	2	Export	Hungary	World	121140	1120680	1120680	1890142
2018	1	Import	Italy	World	121140	1068	1068	14413
2018	1	Import	Luxembourg	World	121140	40	40	256
2018	1	Import	Namibia	World	121140	235		36
2018	1	Import	Netherlands	World	121140	187	187	1204
2018	2	Export	Netherlands	World	121140	72	72	1889
2018	1	Import	Palau	World	121140	1	1	36
2018	1	Import	Portugal	World	121140	35352728	35352728	2660849
2018	2	Export	Portugal	World	121140	1079637	1079637	542692
2018	2	Export	Singapore	World	121140	5935		7520
2018	1	Import	Slovakia	World	121140	201320	201320	243658
2018	2	Export	Slovakia	World	121140	72000	72000	46474
2018	1	Import	South Africa	World	121140	90	90	40
2018	2	Export	South Africa	World	121140	15950	15950	169678
2018	2	Export	Spain	World	121140	1250	1250	14342
2018	1	Import	Eswatini	World	121140	11	11	60
2018	2	Export	Turkey	World	121140	65	65	695
2018	1	Import	Uganda	World	121140	12	12	27
2018	1	Import	North Macedonia	World	121140	23000	23000	77983
2018	1	Import	United Kingdom	World	121140	89	89	3885
2018	1	Import	Afghanistan	World	121140	3076951	3076951	311432
2018	1	Import	Burundi	World	121140	554	554	296
2018	2	Export	Georgia	World	121140	160	160	3704
2018	1	Import	Egypt	World	121140	510	510	2977
2018	2	Export	Egypt	World	121140	250	250	1352
2018	1	Import	Sao Tome and Principe	World	121140	9	9	468

Finally, the import-export graphs for opium alkaloids show that the international trade on this commodity is led by North America, Europe and Oceania mostly. This affirms my hypothesis that most of the extraction and creation value, close to $1BN business in the recent years, is concentrated in these regions. This shows that while opium sap can be a business of most $60M, pharmaceutical industries are able to generate more profits in transforming opium into opiate-based medicine than the value of the cultivation of the raw material itself. However, China and India who are purportedly large actors in the active pharmaceutical ingredients are not visible in this graph.[88] This is probably due to data collection biases. Other graphs can be found in the appendix, but mostly show countries involved with the data available, which corresponds in general terms to the list of countries that can be involved in this industry. The separation of supplier countries in this trade seems less clear than in official reports or convention and the reality of the market shows that more actors are involved. Many questions remain unanswered, and some countries which appear to take part are not mentioned outside of this data.[89]

[88] On the WTO website, I have found that certain countries have "most-favored nation tariffs" on the international trade of opium and its derivatives. If interested on this data, see appendix 12 for an extract of the ones that benefited the most. The link to the online data with the variables already applied: https://data.wto.org/?idSavedQuery=c99f41cb-e8f7-4a47-8542-01fffebe868a accessed on December 20th, 2020.

[89] The reader in having figures and means for comparisons. I also looked whether any patterns can be shown with the global flow of heroin through illegal routes, from various origins but difficulties were encountered to correlate the data as they are aggregated differently, but it could be worthy to examine it in another research. However, what can be said at this point is the geographical proximity of the actors involved in licit production and manufacture to illicit production and manufacture routes. This is an important food for thought to bear in mind as it can have many implications.

Figure 20 : Import-Export opium alkaloids 1995-2018



Source: Harvard Atlas

In a globalized and privatized world, one can say that making global policy results from the mastery of 'network diplomacy'– the negotiation of a wide range of relationships with states, NGO and commercial actors.[90] By extension, the utility of assemblage theory can encourage to study how actors establish and

[90] These coalitions (in network diplomacy) are most effective when they create strong linkages and partnerships between these states and civil society actors at all levels (officials, parliamentarians, politicians, etc.) based on their comparative advantages" (Bolton; Nash, 2010: 172), but also with the corporate, as in fine, the appliance of compliance relies mostly on these actors.

maintain relations, and create shared regulatory spaces and narratives, as discussed by Bueger (2018:615). In addition, in this section it is possible to see what Breger (2020: 3) was describing: "commodities in industrial capitalist economies, including drug technologies, are "assemblages" that reflect in microcosm the broader social-ecological dynamics that create them" and we see multiscalar trade, with "multiscalar politics and global complexity" (Williams, 2010: 302) taking part in this industry, but which can be outlined in other types of industries too.

Practices: domestic consumption

There is one crucial critical node, which is admitted by most actors involved in the global production network: diversion practices by individuals, but most specifically the practices that occur in the distribution and consumption phase (Schild, 2020).[91] Indeed, when it comes to regulate and comply, it is affirmed that many useful tools have been put in place in order to avoid diversion, or any junctures of licit and illicit converging. In addition, when diversion is brought to the table, a common presupposition is that every single actor has a specific role in the global production network and has its own responsibility when dealing with controlled substances. With a mixture of trust and mistrust, regulation and compliance, the global production network should therefore work. However, the opioid crisis has highlighted practices that most likely have been in place for some time.

The difference is that now they happen in the light, and some of these practices can evolve with time but mainly remain consistent in their behavior. In that respect, just like in *full* illegal markets, they are resilient and adapt themselves to external factors in order to be

[91]It is assumed in licit production and commercialization diversion practices are caused by actions of individuals mostly. Whereas in illegal trafficking, it is assumed to be organized (transnational) groups. Although it seems mostly be the results of individuals in my topic, no certainty as to whether organized groups acting in licit production/commerce take place.

viable. Interestingly, the participants of illicit practices in the legal industry tend to be similar. Although, as we have seen, diversion practices can differ from the geographical position, once identified they remain stable.

Within a perspective of global production network, once the medicine has been formulated, it is the moment that it is distributed. Between the distribution and consumption, malpractice can arise. As soon as medicines are distributed, another critical node, agreed by all the interviewees I discussed with, is a source of illicit. As with most medicines, they have different uses, and may be targeted for research, in closed research facilities, highly controlled and in which not much diversion happens.

Medicines can be prescribed, distributed and are usually consumed in hospitals, where much diversion arises. Medications are stolen by nurses and rarely patients (Titan group DEA, 2020). Other than in hospital facilities, drugs are prescribed by doctors and sold in pharmacies. In this context, malpractice can happen. Indeed, it has been shown that some patients do "doctor shopping" (The Canyon, n.d.) – obtaining prescriptions from different doctors in order to have more of the same medications (Green; Bowman; Ray; *et al*, 2013).

Patients have been known to sell their own medicines in the street – elderly and youngsters are a phenomenon seen throughout the world (CBS news, December 13th,2005; Additude, March 21st, 2018; AARP, May 18th, 2017), and in terms of consumption, practices of self-medication and "off-label" – using the prescribed drug for another purpose than the prescription - (Schild, 2020) are common.

Another non-medical practice is the theft of medicines from family members and acquaintances, happening more frequently than thought (Healthcare Finance, August 22nd, 2017). Also, pharmacies have been accused of selling prescribed drugs despite obvious "red flags" (News&Observer, December 17th, 2020), or as seen in the

opioid crisis, doctors over-prescribing for their own benefits (NBC, December 20th, 2020).[92]

There are further places in which diversion happen, and depending on the source, where most diversion is present. This is the case in veterinary practice, for example (Titan Group DEA, 2020; Veterinary Doctor, December 2020), whereas unique feature involves medicines being prescribed and sold in the same facility. Although subject to the same regulations as for humans, diversion occurs often in animal treatment environment in facilities such as animal hospitals, in private clinics and animal refuges.

A practice also seen for other medications is the pharmaceutical industries' lobby for the use of medicines. Well-supervised by regulatory bodies, care is required in how they market their products and the loyalty programs they organize. In the past, training in medical conferences was largely sponsored by such industries, and from the doctors interviews I gathered, most told me that they had questioned, at least once, the therapeutic adequateness of certain medicines. As mentioned earlier, this is notonly the case for opiates, in which it is felt that new markets are created for the substance sold by industries – i.e., the case for CBD and proton-pump inhibitors – PPIs (Veterinarian, 2020). In that respect, Lakoff (2005: 174) talks about "diagnostic truing" – the art of adapting the diagnostic to medicines in the market. She shows the relationship between pharmaceutical industries and the prescription and distribution to medicines in medical facilities.

Furthermore, doctors working in this environment have been confronted with another trend. In the eighties, the prescription and use of opiates was disapproved, and most were afraid of using it in their practice, a term coined as "opiophobia" (Schild, October 2020). This fear made them use other types of substances. However, for about thirty years now, the relation to pain has changed dramatically for both humans and animals.

[92] Another implication of over-prescription is once discovered, or if the dependence is too high, patients result to the black market to feed their addiction.

Indeed, now doctors must counteract pain, or be seen as not doing enough to relieve patients and animals. This is not only a societal demand, but also comes from the demand of patients and animal owners.[93] It is a phenomenon that has another implication.

Since the measurement of pain is relative and subjective to a certain degree, prescriptions of these medicines are "variable prescriptions" (Veterinarian, 2020). This means that the dosage will depend on the pain intensity felt, and left to the patient to take, following the recommended dose, whenever they need it. From a point of view of preventing diversion, these variable prescriptions provide an opening to malpractice, but, from a health and efficiency point of view, this option is preferred. It is similar to giving a higher dosage in hospital settings so that the patient can leave the facility earlier and continue treatment at home, leaving space for another patient. The risk here is over-prescription, not necessarily illicit but which can have detrimental consequences.

Another aspect of the difficulty that health care professionals confront is the close collaboration with pharmaceutical industries. It is a required close collaboration that they work together as medicines are fundamental in health practice. Both are interdependent (Schild, 2020). This can create a peculiar climate as criticism would not be welcomed from the industries and because of the dependence of the health sector on them, this reduces the space for a real healthy relationship. It is as a zero-sum game, and even if not, all doctors are of good intentions, the ones I have interviewed shared that in their practice, they have had to ask themselves about reasons underlying certain behaviors and remain true to themselves in order to avoid malpractice (Anonymous, 2020; Veterinarian, 2020).

[93] When discussing with Diane Steber Büchli about the opioid crisis she mentioned a question had been added in the doctor's checkup: "are you suffering pain?" but at this stage however they didn't realize the different pains.

For pharmaceutical industries and governments, fighting against counterfeit medicines. is a particular issue as trust, reputation and benefits are involved as well as the health of innocent citizens (Anonymous, 2020, Dilkushi, 2020, Steber Büchli, 2020). Finally, another malpractice, which could lead to diversion and constitute a critical node is the corruption of official agents, representatives from all sectors, the latest news on the subject being a corrupted DEA agent (Breitbart, December 5th, 2020) in which greed surpassed the sense of duty (Steber Büchli, 2020).[94]

In practice, but also throughout the global supply chain, a social phenomenon discussed by Appadurai (1986) appears, the *social life* of a commodity. His work is known for the value of commodities, and how different value regimes exist within one commodity. In my case, this can be seen as different ideas and norms prevail depending on which standpoint one look into it. The meanings differ, and for medicines this has been studied previously. (Van der Geest, 2012: 9). Medicines *travel* in the sense that their meaning and the relations to them transfer in various social spheres. They have a *social life* to follow Appadurai's work (Van der Geest; Kinsman; Hardon; *et al.,* 2010: 44). Following this understanding, this is how "medicines could flow from medical locations to the economic sphere where they are subject to illicit trafficking" (Lovell, 2008: 309).

To summarize and respond to the question: what are the critical nodes in the global production network of opiates in which *licit* and *illicit* can become indistinguishable categories? There are a few points to reiterate in order to answer this question.

First of all, the global production network, specifically focused here on the global industry level, has shown that such categories –

[94] Tools have been put in place domestically in order to prevent diversion from occurring. For example, automated dispensing systems which inventories every medicine and only dispense the needed dose. But it has happened that automated dispensing systems technicians have had diversion practices in the past (Titan Group DEA, 2020). Therefore, there are no easy solutions when it comes to diversion.

licit and illicit – are never quite distinguishable. The meanings and interpretations differ depending on social groups and are translated differently. There is what is written, *stricto sensu*, and in practice, and in which practice. However, two extremes can be drawn: a fully illicit activity and a fully licit one. Anything in between, as Goodhand and Mansfield (2013: 224) describe is a scale of "semi-licit graduation". To some actors, there are heterogenous categories, describing parallel and competitive markets such as, from my interviewees sample of representative groups, law-enforcement, regulators and health practicians. To them, the expression of illicit practices penetrates licit practices by spikes of independent illicit actions.

Whereas I see this through a perspective of structuralism, in which illicit practices can arise by independent spikes but also be organized in their diversion practices, thus also illustrating social phenomena, I see it more as an expression of a system. Others I exchanged with, such as Medicrime, to my question answered 'no' to my question "do you believe legal and illegal activities are distinguishable?", agreeing that these categories are not, in any case, hermetic. From my understanding, it is more the penetration of illicit activities in the licit market that happens, than the licit market resulting in illicit activities.

I was able to identify critical nodes, most confirmed by my research.[95] However, due to the fact that such practice *is illicit*, data are limited. In terms of critical nodes in the global supply chain, to summarize, they can intervene at various moments: poppy seeds, cultivation, harvest, manufacturing, transport, retailing, selling, consumption, for human, animals and research purposes. The logic and reasons in the critical nodes might differ but results are similar.

Finally, another observation should be made. Illegal supply-chain can converge to legal ones due to the geographical proximity, as seen for instance in Afghanistan, Iran and Pakistan with India. Three main networks facilitated by geographical proximity can be

[95] For example, to my question: "do you think there are nodes in the global supply chain that favorize illicit activities?" asked to Medicrime, they responded "yes".

India/Pakistan/Iran/Afghanistan (extended Golden Crescent); Thailand/Laos/Myanmar (Golden Triangle); Mexico/Colombia (Bashir, 2002: 11; Miltenburg, 2018). Corruption is a global phenomenon and one can imagine that such production, to some degree (licit and illicit) can adopt modern slavery practices. There is a link between India being the biggest manufacturer of opiates, and generally a key player in the pharmaceutical industry, with being the prime source of counterfeit medicines. It is quite certain that licit pharmaceutical industries not being supplied by illicit sources as much as regulation, compliance and tools are effective, and in that respect, this is what authorities say they ensure (Steber Büchli, 2020; Schild, 2020).[96]

Let us now turn to observations that can be made on the global production networks of opiates, applying the studies of the field, for this analysis. After covering this aspect, I will finalize my answer to the second research question regarding the role of the UNODC inthe regulation of the critical nodes of controlled substances used in medicine.

Observations on the global production network of opiates

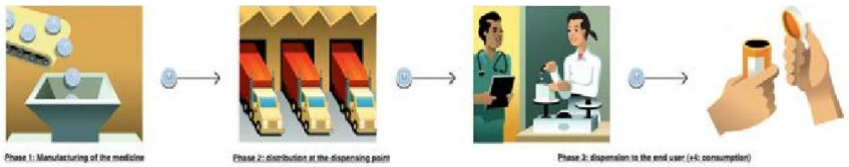
In the literature of the pharmaceutical value chain, three phases are usually described. Lovell (2008: 56) highlights three phases: 1. the manufacturing of the medicine; 2. the distribution at the dispensing point, 3. the dispensing to the end user.[97] The first phase are the steps involved from the initial research and development phase, to gaining regulatory approval and the commercialization.

[96] On that point, when discussing with Diane Steber Büchli, she shared that companies would not result to substances for which they are not a hundred percent sure about. But yes, there is always a box or two that might be lost or stolen in the process (2020).

[97] For more information on the pharmaceutical supply chain and their use of technology, see: https://www.pharmaceuticalcommerce.com/supply-chain-logistics/managing-supply-%20chains-cloud/ accessed on December 22nd , 2020.

Two categories of manufacturing occur for the drug production: the active pharmaceutical ingredient (raw material used in medicine) to the finished form, also known as the formulation stage (the form and excipient are chosen). The second phase includes the transportation and handling of the medicine from the manufacturer to the end user. The third phase involves providing the correct medicine dosage and form, to the right patient in a convenient and timely manner. As seen above, it is now clear that at each step of the licit supply chain, critical nodes can be found and be vector of illicit practices.

Figure 21 : Usual supply chain of medicines



Summary of the phases with the consumption phase. The image was taken from Mallinckrodt website. The legend is my own.

What is missing in this figure is the supply of the ingredients in the manufacturing. This absence is interesting. Indeed, it is rare to think of the supply of active pharmaceutical ingredients as a process of making medicine. Otherwise, it is not general knowledgeto be aware of the sources of these substances and how it works overall is taken for granted.

From Lovell's stages and Mallinckrodt's graph I would therefore add two phases: 1. supply before manufacturing; and to Lovell's phases: 2. consumption after dispensing to the end user.

Figure 22 : Supply chain of medicines

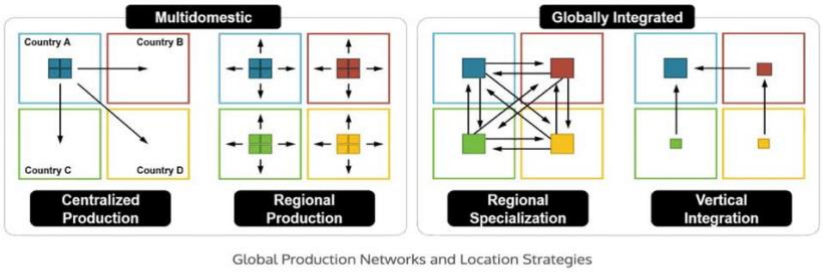
In a perspective of value chain, this integrates the network of production, trade and service activities that covers all the stages in a supply chain, from the transformation of raw materials, through

intermediate manufacturing stages to the delivery of finished goods. The chain is conceptualized as a series of nodes, linked by various types of transactions (Rodrigue, 2020).

In global production network studies, a useful figure to examine the structure of opiate global production networks is through the location strategies of companies throughout the supply chain. What is usually distinguished is multidomestic strategy (centralized or regional production) *vs* globally integrated strategy (regional specialization or vertical integration). In this research, it seems like it is a combination of all four.

For the cases examined above, the example of Tasmania is that two companies operate between a mixture of centralized and regional production. For India, it is a state-owned business, from regional production for the cultivation by independent, yetcontrolled farmers - and centralized, as to when it is sold to other businesses or for the formulation process of medicines.

Figure 23 : Global production networks and location strategy



Source: Adapted from Knox and Agnew (1998) The Geography of the World Economy, Third Edition, London: Arnold.

However, the global production networks of opiate also have globally integrated facets. For instance, multinational pharmaceutical industries outsourcing parts of the manufacturing abroad, based upon comparative advantages. This is the case with American pharmaceutical industries, from which their active pharmaceutical – ready-made – are manufactured in countries such as India and China, then sold to the US for them to finalize the

manufacturing with the formulation and the final commercialization stage. This is mostly regional specialization.[98]

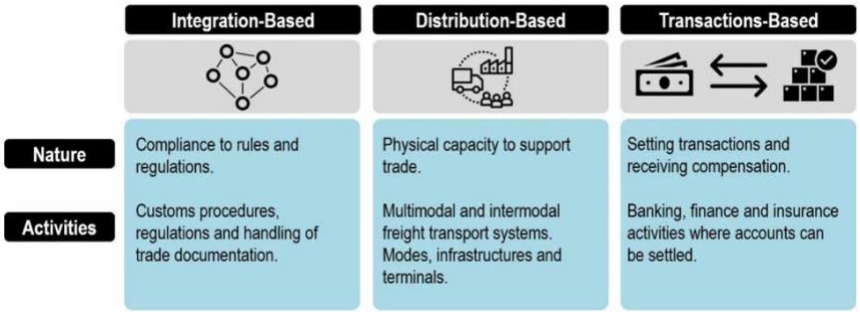
There are different observations that can be discussed on the global production network of opiates. Miltenburg (2018) examined the global production network of illicit opiates and describes the networks of opium being convergent. This means that "the one raw material (opium poppy) becomes one or small number of end products (heroin)". I disagree, seeing opium networks are divergent "the one raw material […] becomes many different end products (different grades, dimensions and lengths […]" (Miltenburg, 2018: 4). As I have shown in the graph of the international trade of this commodity, it seems that opium can vary greatly in grades, dimensions and lengths and create various organized networks around these commodities, implicating kinds of trade flow.

It is therefore possible to see international divisions of labor (Hudson, 2016), and macro-economic geographies (Peck, 2016) which "are continually being forged and "the result is a finely grained, multiscale, territorial patchwork of diverging real incomes and rates of labor-force participation: between states and regions; within regions; between core areas and peripheral areas; and between prosperous metropolitan regions and less-prosperous ones" (Martin *et al.*, 2018: 10)" (Coe; Yeung, 2019). Characterized by private-public partnerships, with a mixture of state-owned monopolies and private companies, in which pharmaceutical industries are non-state authorities, they detain power in the sense of Strange – "to be gauged by influence over outcomes rather than mere possession of capabilities/resources" which is "exercised

[98] For examples of companies working in this industry: PannonPharma is a company in Hungary which offers Concentrate of Poppy Straw, Poppy Straw Extracts (CPS AMA and CPS ATA) and APIs from controlled cultivation and herbal extracts (PannonPharma, n.d.). Mallinckrodt is involved too. Shipments made by Government Opium and Alkaloids Factories in India, stopping in Hong Kong before being shipped to New York. Long logistics are implied. This was found in market intelligence websites (Panjiva, n.d.) and also the Government Opium and Alkaloids Factories website (https://goaf.gov.in/index.html) accessed on December 22nd, 2020. There are also many Active Pharmaceutical Ingredients companies that focus only on this, such as: TAPI (Israck), Dr Reddy's, Aurobindo, Cipla, Ranbaxy but now belongs to Sun Pharma (India).

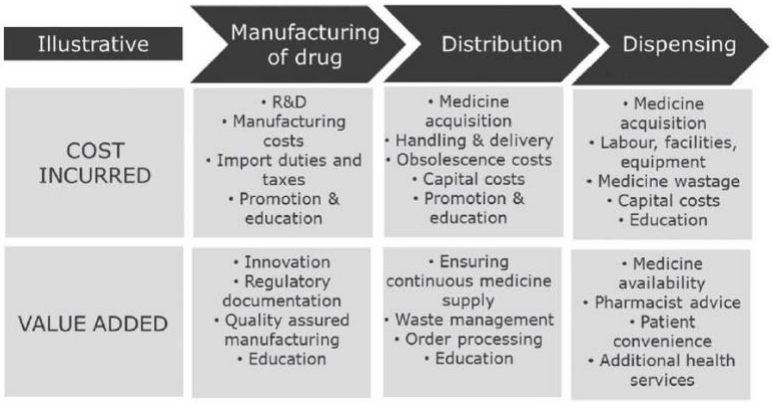
impersonally by markets and unintentionally by those who sell, buy, deal in markets" (Strange, 2009: 52). There are various dimensions of trade facilitation as Rodrigue (2020) shows in Figure 24, copied below:

Figure 24 : Trade facilitation dimensions



Their power is impressive, and they can also be prone to abusive practice, as numerous scandals have shown in the past (Le Monde, September 9th, 2020; Hermann; Lasko; Maadad, 2020). They have various associations and federations such as the International Federation of Pharmaceutical Manufacturers & Associations (IFPMA, n.d.) in which they organize discussions around pharmaceuticals. Other general characteristics of the pharmaceutical chain involves the costs and value added, illustrative of their *Weltanschauung*. Aitken's (2016: 57) figure 25 expresses this clearly:

Figure 25 : Value chain of the pharmaceutical industry



An important difference between pharmaceutical companiesis their product-portfolio and whether or not they depend on the

availability of raw material. Whether the substance is scar or abundant with the necessity-convenience nexus while imply different strategies.[99] But perhaps the most flagrant trait is the competition that prevails. Competitive rivalry is extremely intense[100] (ABC, June 23rd, 2018): "with more than $1 trillion in global sales, the pharmaceutical business can be cutthroat." (Investopedia, January 4th, 2020). They strive for the discovery of blockbusters and the protection of their intellectual property, all of which have been highly discussed. In this respect, the Alcaliber webpage, a Spanish company known for their production of narcotic products, highlights the mentality that is found in such companies.[101]

However, with the example of Tasmania, one can see the vertical integration. An Indian company (Sun Pharma) has boughtthe GSK opiate business in Tasmania allowing it to oversee theprocess from poppies to the medicine (Business Standard, March 4th, 2015; Fiercepharma, March 3rd, 2015; ABC, May 9th, 2016).

Global production networks must be dynamic – i.e. adapt and restructure through time – in order to generate profit and be viable. Due to external factors such as technology innovation, environmental conditions, international, regional, national regulations.[102] For example, India, in order to remain a competitor in the global market had to extend the scope of its services and started to use the concentrate poppy straw method (formerly usually reserved to the Global North apart from Turkey). In terms of products, it started to manufacture a wider range than initially, including codeine phosphate (The Economic Times, May 18th,

[99] In appendix 17– see a figure that outline the differences

[100] For example, India has turned to minimum quantity yield from opium to morphine based. "Morphine yield differs from area to area as soil fertility and dew affects the morphine content, so growers will not be able to provide desired morphine, which will mean that the number of licenses issued will go down" which will affect growers. This is again, a sign of high competition targeted around profit (Hindustan Times, October 27th, 2017).

[101] The website can be accessed through this link: https://alcaliber.com/productos/

[102] This sense of dynamicity can be observed with illegal trafficking. As noted by the World Drug Report published by the UNODC "traffickers show resilience by changing routes and production practices" (2020: 19).

2019). The Government of India, Ministry of Finance, made a public declaration inviting interested companies to apply to produce concentrate of poppy straw and manufacture alkaloids.[103] But being dynamic applies to the critical nodes too. Practices and the location of nodes might change, and the market and illicit activities are resilient and adapt. However, regulations don't usually follow the pace of the restructuring global production networks, in general a little behind of the realities of practice; if the objective of regulations is to prevent diversion.[104]

With competition comes mistrust, not only between the pharmaceutical actors, but from anyone dealing with the pharmaceutical industry world, from industries to regulators, to health practice, to scholars. I contacted a number of pharmaceutical companies who expressed their wish not to divulgate any information, as it was deemed confidential. "Unfortunately, we are not in the position to answer your questions" replied Merck, or La Roche on the phone telling me it is "confidential" information. Novartis after forwarding my calls to all departments possible finally said they were unable to inform me as due to the private nature of the data. Johnson and Johnson responded negatively by email claiming data privacy -- not allowed to divulge any information on the questions asked. Words changed but the results were the same. Sanofi is one of the only pharmaceutical company that shows on their website, publicly, that they grow and harvest opium poppy and

[103] "So far, only opium gum has been produced in India. Govt. of India has now decided that CPS production should be commenced in India. For this purpose, it has decided to select and license one company. This notice invites Expression of Interest (EOI) from companies willing to produce CPS in India, within 60 days from publication of this notice." File number: 616/1/2007-NC-1 accessed on December 23rd, 2020: https://dor.gov.in/sites/default/files/7_0.pdf This raises another issue to consider, if India results to CPS, is its traditional cultivation and harvesting method at risk of disappearing?

[104] To my question to Medicrime (2020): "Do the techniques of diversions change over time?" they responded: "yes (used systems, trading routes)." To another question asking: "do you have to adapt the strategies put forward in order to remain adequate?" they answered by the affirmative. However, when asked: "Are there enough regulations instruments in place to avoid misuse?" they also responded by the affirmative. But the latter should perhaps not be taken as it is, since they might not be able to respond differently as it was an official correspondence, for the reputation of the organization.

manufacture fifteen active pharmaceutical ingredients from it.[105] Finally, the only person able to provide me with information on the pharmaceutical industries was the one I interviewed, who had retired and requested to remain anonymous.

Pharmaceutical industries have a liability to know their provider – when discussing with a senior retired employee, to my question: do you know all the actors involved? He responded: "yes, it is our responsibility". Furthermore, to my question "would you say there is trust between the various actors?" He responded firmly by "absolutely no trust". I asked whether pharmaceutical industries work together, and he responded that "it depends but usually not". To finish by saying that this industry is "too complicated, highly risky and competitive, and too many variations between a small and big company." I thought his last sentence was extremely telling: "there is no such thing as business as usual in this industry." (Anonymous, 2020). To my email exchange with Medicrime, part of Swissmedic, when I asked: "do you trust pharmaceutical industries?" they answered: "yes and no (depending on the system used to license/authorize the companies)" (Medicrime, 2020).

Therefore, it makes sense that with mistrust and regulation comes a compliance market. Indeed, as for other industries, a part of the global production network is compliance. Many businesses[106] have flourished and specialized in certain kinds of compliance, either independent or state-mandated companies. They usually focus on the whole supply chain, on the technology side, service and resources management, logistics domestic and global, or regulation based. Their aim is to ensure businesses of doing right, be more efficient and prevent diversion from occurring. It is in fact diversion prevention and the content that is produced in that respect that

[105] See appendix 20 for a screenshot of the website section.
[106] For example, of companies that provide compliance services, here is a selection: Systech, Cambrex, Titan Group DEA or McKensson. For an example, see this link: https://www.mckesson.com/about-mckesson/fighting-opioid-abuse/controlled-substance-monitoring-program/accessed December 27th, 2020

helped me identify critical nodes. Through their strategies one can assume the reasons underlying choices[107]. A globalized industry like this one also reflects different corporate cultures and domestic regulations. It is said that about 20% variation arises when undertaking global operations (Anonymous, 2020).

In the first part of this chapter, I have delved into thecritical nodes I have identified in the global production networks of opiates. In the following part, I have analyzed through global production network studies the empirical case study (opiates). Now that I have outlined the critical nodes and made general observations on the global production networks, I shall examine what is the role of the UNODC in the regulation of the critical nodes of controlled substances used for medicines.

The role of the UNODC

When I began my research, I believed the UNODC had an important role in the regulation of controlled substances used for medicines. They do in fact have a general role, but it is in the international drug control regime. In 1997, on the initiative of Kofi Annan, and since the issues of drugs and crime clearly intersect, they merged two UN programs (International Drug Control Program (UNDCP) and the Crime Prevention and Criminal Justice Division). The change was implemented by the creation in 2003 of the UNODC (UN General Assembly, 1997). The UNODC contains the word "drugs" (United Nations Office of Drugs and Crime), but it seems they concentrate more on issues other than licit trade and its critical nodes. The UNODC defines itself as "a global leader in the fight against illicit drugs and international crime, in addition to being responsible for implementing the United Nations lead programme

[107] The American Society of Heath-System Pharmacists produced guidelines, some that targets diversion of controlled substances. These documents were illustrative of certain practices. For example, the practice in certain countries (like in the U.K) of only giving the necessary medicine dosage rather than a full package. Obviously, this practice is not only diversion oriented but also shows consideration to medicine waste and better management. This thought can raise to other concerns as to medicine waste and its management. This phase could potentially be a critical node too to bear in mind (ASHP, 2017).

on terrorism." It can be seen with this quote that the matters of their interest are therefore different from the one of this study (UNOV, n.d.).

The UNODC therefore focus primarily on matters such as transnational organized crime, human trafficking and corruption.[108] They have a collaborative role in assisting the INCB and CND in performing their treaty-based functions and in assisting state parties in the implementation of their obligations under the international treaties (UNODC, n.d.). The UNODC merge research and actions in one place, while hosting conferences and being a referential organization for other agencies. They produce reports and estimates and work closely with states and civil society. They detain *soft power* in producing norms but mainly do *naming* and *shaming* (Tinasti, 2020). With respect to producing regulation itself, however, they do not actively contribute, although some bodies under the UNODC do so (such as the Commission on Narcotic Drugs – CND).

In terms of initiatives aiming at enforcing the conventions, the UNDOC has various partnerships, UN intra-agencies and private-public partnerships. These programs are mostly focused on the fight against illicit trade.[109] An example of intra-agency initiatives is the UNODC and WCO in their container control programs. Their aim is to build capacity for countries willing to improve "risk management, supply chain security, and trade facilitation in seaports, airports and land border crossings in order to prevent the cross-border movement

[108] An interesting perspective is following Buegger and Knorr Cetina on "epistemic practices". Epistemic practices aim at making generalizable claims about such objects, by drawing different particulars together, including data, facts, and claims. "They are tempo-spatially distributed, and the epistemic infrastructures bring together various sites. An epistemic object is produced in various sites, including organizations, and will involve different kinds of epistemic practices" (Bueger, 2018:7). Certain sites will be more important than others, exerting control and will sustain the whole structure. STS scholars refer to these as "laboratories". "Laboratories are sites of mediation that bring about and shape structures and which combine elements from different contexts. They assemble and bring together entities and processes with the objective of developing more enduring connections, which create a common biography and entail their own dynamics." (Knorr Cetina 2008:64).

[109] Diversion from licit sources is not a priority for the UNODC which reaffirms one of my hypotheses.

of illicit goods" (UNODC, 2020). An example of another initiative of UN agencies and other organizations is the Paris Pact Initiative (PPI). It consists of 58 partner countries and 23 organizations and combats illicit traffic in opiates originating in Afghanistan (UNODC, 2020).

A final example of inter-agency and private-public partnership is what the UNODC has developed against the opioid crisis, known as the *opioid strategy*[110] based on the principles of "predict, prevent and protect" (UNODC, 2020). This opioid strategy includes the following partners: the WHO, INCB, WCO, Universal Postal Union, INTERPOL, EUROPOL, as well as strategic regional organizations such as the Organization of American States, the European Monitoring Centre for Drug Dependence and Addiction, African Union and the Organization for Economic Cooperation and Development. For such a globalized and interdisciplinary matter, partners from various sectors are necessary (UNODC, 2020) and their focus is on illegal trafficking above all. They also work on New Psychoactive Substances (NPS) and precursors (necessarychemicals to manufacture drugs) which intersect with legitimate enterprises due to their use in many sectors (UNODC, 2014), and on drug precursor diversion – when individuals or groups take these products out of the legal market and use them for illegal purposes. Aside from these examples, they are heavily involved in opium replacement programs – crop replacement projects such as those in Turkey and parts in Afghanistan (INCB, n.d.).

Regarding the specific issue of critical nodes, the UNODC does not act directly and plays no role. In terms of the regulation of the critical nodes, the convention does have certain articles in which they require the use of tools to monitor the forms of goods. Apart from these conventions, however, there are no regulations on critical nodes. This contrasts with new psychoactive substances or precursors, where the CND revises regularly its lists of controlled

[110] See the strategy in detail in appendix 18.

Substances in order to stay up to date, but where the market seems to evolve more rapidly than the pace of bureaucratic regulation. Another body that has a *bigger* role in critical nodes is the INCB. Its role involves implementation of the regulation and it collaborates directly with signatory Parties. INCB is there to facilitate the trade of internationally controlled substances and to balance the demands of medical and research necessities with supply. They produce estimates with the help of Governments and are responsible for examining the import/export of controlled substances. Typically, for the case of India as an example in the traditional cultivation and harvest method, the INCB reviews the licenses authorized for opium. Apart from overseeing import/export and producing reports and estimates, they also have three tools to help governments trading.

These three specific tools for governments can be found on the webpage of the INCB (2020). The first is the *I2ES*: International Import and Export Authorization System – a platform allowing governments to exchange import and export authorizations for narcotic drugs and psychotropic substances (INCB, 2019). The second tool is the *PEN Online:* Pre-Export Notification which allows exporting countries to electronically notify receiving countries of exports of precursor chemicals. The third tool is the *PICS*: Precursor Incident Communications System which permits governments to report to INCB and/or other countries when unauthorized activity involving a precursor chemical occurs (INCB, July 2020).

In addition, the WHO takes part in the international drug control regime through the ECDD and the International Nonproprietary Names (INN). The WHO recommends that countries, hospitals, health centers, pharmacists and anyone dealing with medicines be especially attentive to counterfeit medicines. But apart from this main issue of counterfeit medicine, no concrete actions focus

specifically on diversion, as it is not in their mandate (Dilkushi, 2020).

One must also consider the role of EUROPOL and INTERPOL. Their role in critical nodes is not publicly expressed but their involvement against illicit trafficking and all kind of organized crime is certain. Apart from official reports, no other document supports their potential work against the critical nodes.

Regarding the regulation of critical nodes, a policy transfer can be observed from the conventions (international sphere) to regional organizations (such as the EMCDDA at the European level) and then to national levels (Graham; Volden; Shipan, 2013). Each country is asked to apply the conventions, trace the trade and generate estimates. Countries are thus extremely important in their role of the critical nodes, as they are the first to be expected to observe any diversion. It is considered that governments are the first entities to deal with critical nodes, both in prevention and in action. They can count on international cooperation for detection and programs to help them achieve the international objectives. To return to Horner's four roles of states, nation-states in this context fulfil the four. They are regulators by ratifying the conventions and implementing them at the national level. They are producers of controlled substances; they are buyers; and they are investors of controlled substances or in the international drug control regime.

Moreover, powerful actors in practice are the pharmaceutical industries. This power was clearly expressed in various discussions I had. When asked whether it is the government or pharmaceutical company's responsibility for the licit supply, I was told that the pharmaceutical industry is in charge, but that domestic medical agencies supervise (Titan Group DEA, 2020; Schild, 2020; Medicrime, 2020; Anonymous, 2020). This strongly suggest what Strange (1996: 4) argues: "[…] now it is the market, on many crucial issues that are the masters of governments states." One can see the imbalance of power between the various actors.

Langenhove described (2010) a number of aspects of multilateralism 2.0, as being the diversification of multilateral organizations, the importance of nonstate actors and the increased interlinkages between policy domains. This can be seen in the context as well, through multilateral organizations working on one aspect or another of controlled substances and theinterconnectedness between the domains (and the difficulty it creates) with the importance of nonstate actors. For instance, the epistemic community requests reforms and to some extent gains these on certain grounds (the example of rescheduling at the UN level of cannabis just recently).

Another observation which crystalized when collecting the data was the technical microcosms around the subject of controlled substances. Some of my interviewees, mostly from the medical sphere, were unaware of the conventions, the UN work, UNODC nor INCB. It seems therefore that actions – by regulation, implementation or change – come with those informed, in this case, states and nonstate actors which can then mobilize their knowledge and resources towards their objectives and believes. Furthermore, while it is acknowledged that international organizations and governments must adapt their strategies in order to remain relevant to reality, they agree that enough regulations instruments are in place to avoid diversion/misuse/non-medical purposes (Medicrime, 2020; Steber Büchli, 2020).

Finally, following this exploration of my research questions, another question arises – the role of international organizations (INCB, WHO, WCO, WTO), states and nonstate actors in the international drug control regime through the lens of risk assessment in the issues to be prioritized over others. As seen above, the UNODC does not have a particular role in the regulationof critical nodes, and the only entities that have a role in theimplementation may be the INCB, WCO, and law-enforcements. The WHO has the technical mandate of reviewing the substances

(and the new ones) but the CND votes and regulates on the final decision. However, it became clear that issues are prioritized. They are prioritized through risk assessment and successful political bargain among actors involved in the international drug control regime. Once the framework built, it is through this thinking that mandates are given to the actors, and strategies are adopted in the fight of the *drug problem.* This risk assessment and agenda-setting could be the subject of another interesting study (Steber Büchli, 2020).

CONCLUSION

When I first began this research, my overriding question was whether the global production network of controlled substances was *hermetically* licit. The ambivalent nature of controlled substances means that on one hand, they are commodities for the public good, providing access and the right to medical treatment, and on the other hand, they are based on substances with psychotropic attributes which feed addiction and are likely to be diverted into illegal markets causing harm, with moral, societal, health, economic and security implications. Opium seemed a good case study due to its socio-history, its use – and misuse - for millennia in many various purposes. My main research question was thus to determine how a *controlled substance* used in both medicine and illegal drugs markets is regulated at the international level.

In order to answer to this question, it seemed important to examine regulation at the international level from a historical perspective. A thorough analysis was conducted, from the very first agreements to the three main conventions (1961, 1971, 1988) constituting an *international prohibition regime* (Nadelmann, 1990). I then chose to follow with the international drug control regime terminology, bearing in mind the prohibitionist ideologies which built the regimeand was promoted by dominant states. Inspired by many theoretical approaches, I aimed to elaborate a unique

conceptual framework for the questions I addressed. Andreas (2004) mentions the utility – and even the necessity - of eclectic theorizing when it comes to illicit activities. The eclectic theorizing allows one to put forward differentaspects, resulting in a bigger picture. This thinking was intended here: to understand a phenomenon through its interdisciplinary networks. This involved studying the relations between the international sphere (at the UN level) with states, internationalmarkets and illegal international markets.[111] It was a blend of international political economy, illegal international political economy and global production networks. As reminder, global production network, in this thesis, was considered to be a global multiscalar network of licit and illicit economic and noneconomic actors, through licit and/or illicit practices, behaviors, sometimes coordinated, but from which actors are implicated in the specific industry (here opium). Within opium lie many active pharmaceutical ingredients that are used not only in various medicines but are also the source of numerous illicit uses. What comes from opium production is not only the apparent use for pharmaceuticals, but alsoits by-products traded in other sectors.

[111] I have referenced it in the conceptual framework section, but it is important to restate Andreas' description of eclectic theoretical perspectives, in my research topic: "For example, sharp variations in state responses to global drug trafficking (contrast, for example, the highly punitive US approach to the more public health approach of many west European states) cannot be explained without incorporating the role of culture (stressed by social constructivists). The creation and maintenance of a global drug prohibition regime cannot be explained without taking into account the backing of the most powerful states in the international system (stressed by realists), but also cannot be explained without recognizing the role of nonstate actors, including organized societal groups of 'transnational moral entrepreneurs' (stressed by both liberals and constructivists) (Nadelmann, 1990). The fact that some poor countries depend on illegal drug exports to generate foreign exchange and employment can be seen as part of the broader historical pattern of dependence on 'boom and bust' primary export commodities (stressed by Marxists and other radicals in the dependency theory tradition). Viewed from the economic perspective of comparative advantage (as stressed by neoliberal economics), such reliance on illegal drug crops can be interpreted as rational specialization based on a country's competitiveness in a global market niche (thus, Afghan poppy growers and Bolivian coca farmers are, in a sense, taking the advice of western liberal economic advisors literally by growing high-demand export crops in which they have a competitive advantage and that offers them the highest international market returns)" (2004: 645).

I examined this through a commodity lens, but also from a global supply chain perspective, looking at the manufacturers in this industry. The key opposing actors were the legal and illegal production and manufacturing countries involved. For illegal production *only*, two extended regions are designated: the Golden Crescent of Afghanistan, Iran and Pakistan, and the Golden Triangle of Thailand, Laos, and Myanmar. Other countries such as Mexico and Colombia are also involved in the opium/heroin business. Yet questions remain about legitimate and regulated business.

As seen, states and businesses involved can be the source of illegitimate supply in the illicit market, although not advertised as such by international organization, states nor industries. Indeed, in an economic context giving prominence to *laissez-faire* and free trade, the regulation of commodities defined as controlled substances can easily become fraught with difficulties, as Mansfielddescribes with regards to opiate raw material (2001: 9). Consequently, the idea of bottleneck moments, as outlined in global production network studies, in which value is created, captured and transformed, was retained in conceptualizing the critical nodes within the global production network defined. For a globalized trade like this, I assumed that there were critical nodes in the global supplychain of opiate-based medicine in which licit and illicit cultivation, manufacture, production, and transportation join at specific junctures, and in which they bypass the seemingly binary distinction of lawful and unlawful activities.

Critical nodes were defined in this work as microcosms within a network in which value can be created, captured, transformed, or logistically transported; considered as crucial because of their role in the supply-chain and/or in their potential of being exposed to illicit practices such as diversion. This definition takes into account the actors and objects involved in those specific nodes, requiring that the actors and objects (such as regulatory

instruments) combine a mixture of logic which can be subject to change over time.

Based on this definition and my findings, a clear distinction between licit and illicit is unfeasible except in juridical terms. Nonetheless, some nuances emerged. For instance, it appears that entry of illicit sources into the licit opiate trade does not occur, but diversion from licit sources does. Also, entry of illicit sources into the market does occur, and nearly always for the majority of controlled substances and drugs (case of falsified medicines and illegal drugs). Despite the inherent ambivalence of drugs, being both a remedy and poison, this essential feature is what makes effective regulation difficult to attain. In addition, the globalized aspect of the industry provides structural opportunity for many illicit practices to penetrate licit trade of controlled substances.

Indeed, as I have shown in this thesis, the global production network of controlled substances is regulated, highly fragmented, competitive, opaque and full of mistrust. It involves specific processes depending on the methods chosen and the purposes of the commodity. In these processes, the chain contains many nodes that are exposed to diversion practices. The same nodes are usually important phases for value creation, capture and transformation. My findings suggest that regardless of the type of method utilized; critical nodes are present in the licit global production network of opiates. This means that for controlled substances in general, the same assumption can be made. My research addressed this gap. The literature on diversion practices has focused on geographical case studies, such as India or Tasmania, from a political economy perspective, but no work has been undertaken on global production networks of opium combining my conceptual framework with my research subject.

The critical nodes I identified in the opiate industry are hidden in different stages, from poppy fields to consumption. Let us reiterate them briefly. Critical nodes may contain sub-nodes, unique

to the geographical place and culture. The first critical node identified resides in the cultivation phase. In cultivation, illicit activities can come to play with the handling of poppy seeds (their diversion and then their illicit cultivation), cultivation of the opium poppies can arise by the theft of crops from employees or individuals, additional hectares without the proper licenses, falsely claim that licit growing is not harvestable and sell harvests illicitly but also proper licensed and harvested field which yield more than the minimum quantity and the unreported excess can be sold illicitly. After the purchase from the government, diversion can occur due to corrupted agents selling out the government inventory but also, for example in India if the minimum quantity yield is not met, in order to avoid being de-licensed farmer purchases the shortfall, illegally, from a neighbor whose yield is higher. The was to divert are multiple and depends on various variables.

Another critical node lies in the transportation for either manufacture or distribution within or between nations. Licit transportation can be penetrated by illegal activities. The extent to which this happens, again, would depend on the country, the business, the form of commodity and the regulations and practices in place. Furthermore, an important critical node is found in practicesand consumption. Practices include corruption and “doctor shopping”, at the consumption phase, examples are medicines stolenfrom hospital facilities by patients or nurses who consume them or sell them in the streets, but also theft of medicines from family members. Interestingly, this also occurs in veterinary practices, and according to my interviewees, this is where most diversion arises (inthe U.S. at least). Veterinarians are prescribers and sellers, often providing variable prescription according to pain, which leaves roomfor illicit practices. In general, critical nodes contrary to my expectations, does not seem to appear in the context of scientific research purposes; researchers are subject to a strict regulation regime. Generally, critical nodes are present in different forms and

based on the whole structure of the networks. They are subject to change over time, depending on cultures, practices, technologies and regulations. Critical nodes have been studied here through the lens of regulation appliance and diversion aversion. Yet as one of my findings has shown, the way one chooses to view and analyze this highly moralized subject will depend on the objectives, and result in another perspective on risk assessment. For instance, if one is looking at the enforcement of regulations to avoid diversion from a strictly moral and societal standpoint, it is not the *small* amount that is being diverted that counts. It is rather the number of people that we have been able to treat because of the availability and trade of controlled substances.

My second research question was to determine the role of the UNODC in the regulation of critical nodes for controlled substances used for medicines. My findings showed that the UNODC does not play an important role in the regulation of the critical nodes. They do host the Commission on Narcotic Drugs (CND) which evaluate the scheduling of the drugs based upon the recommendations of the ECDD (WHO). Apart from this, the UNODC is rather a bureaucratic organization that focuses on illegal matters. It provides a space for discussions, produces reports, collaborates with states and other organizations and has specific programs to fight for the set agenda they have agreed on. It seems that critical nodes are not a subject deemed to be of high importance for the UNODC which has no role in them. However, the INCB, semi-independent of the UNODC has a mandate to prevent diversion from happening in the licit production of controlled substances. My research question should have therefore been extended to the INCB. The INCB however, has only a limited number of tools to assist governments in enforcing the conventions; they can be available for help or inspections, provide estimates for a balance between supply and demand but do not function beyond this role.

In this research I have therefore addressed a gap in the literature, examining the global production network of licit opium trade in relation to international regulations. However, a few limitations can be discussed. In the controlled substances industry business as usual does not exist. The entry cost is extremely high. Thus, the whole research process has been largely inductive, locating and accessing information which was often contradictory or misleading.

As Williams (2010) says "terminologies are difficult purposely" as this commodity is "not ordinary merchandise". One can say that knowledge is power in this case, as for any other regulated technical subject. It leaves space for only experts to fully grasp what is at stake. The misunderstandings among the active actors are truly striking, and the methodologies and terminologies vary greatly between reports. Another fundamental limit was my numerical data. In this kind of research, data are only "guestimates", so absolutely no information can be taken for granted, even if it comes from legitimate sources. Moreover, due to COVID-19, it has been particularly difficult to access people. Nonetheless, the best effort possible was made to obtain a representative sample of interviewees which helped considerably informing the analysis, but also in clarifying certain information. Finally, I initially aimed to study in greater details the illicit market and its link with the licit. The work has focused on illicit practices penetrating the licit industry, but an interesting study could be made on the examination of the two markets.

This research opens the door to other potential research that could be conducted such as exploring the similarities of the licit and illicit trade routes while comparing the states and non-state actors taking part in these competitive markets. But also, other work could focus on the risk assessment that policymakers undertake to prioritize the issues – their securitization – and agenda-setting. Similarly, another important study should focus specifically on the role of the experts and technocratic bureaucrats of the UN

international drug control regime and the politics behind the expertise and the agenda-setting. This study could use as theoretical roots the *assemblage* theories, which can provide "a feature-rich toolbox sensitive to mundane matters of of international cooperation, the role of objects and things, the importance of territories of governance, the vitality of expert knowledge, and the instability of governance arrangements", as described by Bueger (2018 :615). Yet another study could assess the adaptative-resilience of the global production network in relation to external variables (such as technology). On a post-structuralist perspective, a study on the lexical items mobilized in the global production networks of controlled substances would be of interest, analyzing how this is mobilized by actors, given the highly moralized nature of the topic. Finally, in accordance with the current day-to-day, one could study how COVID-19 has changed our relationship to necessity goods and the perspective of interdependence in the world for issues that are regarded as falling under national security but are nonetheless transnational and highly globalized. What is certain is that the fate of controlled substances is to continue for the foreseeable future. Whatever we decide to prioritize, orienting public policy today will have impacts tomorrow and most likely on the whole network.

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APPENDIX

Appendix 1. Typology of four state roles within global production networks

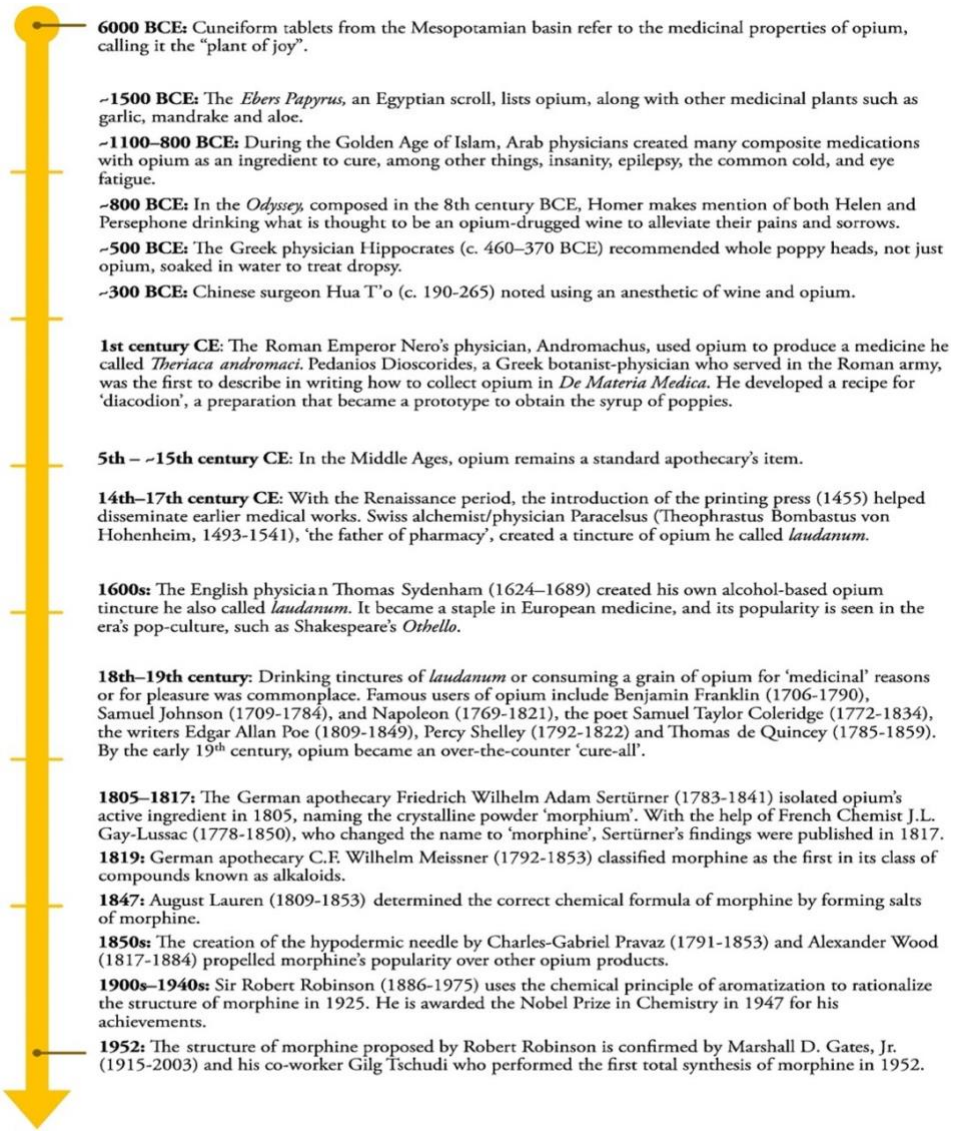
Role	Definition	Examples
Facilitator	Assisting firms in GPNs in relation to the challenges of the global economy	Tax incentives, subsidies, export processing zones, incentives for R&D, implementing and negotiating favourable trade policies, and interstate lobbying
Regulator	Measures that limit and restrict the activities of firms within GPNs	State marketing boards, price controls, restrictions on foreign investment, trade policy (tariffs and quotas), patent laws, labour regulation, quality controls, and standards implementation
Producer	State-owned firms, which compete for market share with other firms within GPNs	State-owned companies, for example, in oil and mining.
Buyer	State purchases output of a firm	Public procurement, for example, of military equipment and pharmaceuticals.

Source: Author's construction.

Note. GPN = global production network; R&D = research and development.

Source: Horner, R. (2017). Beyond facilitator? State roles in global value chain and global production networks. *Geography Compass, 11*, p.6

Appendix 2. Chronology of opium use in long history



Source: Brook, K., Bennett, J., Desai, Sukumar P. (2017). The ChemicalHistory of Morphine: An 8000-year Journey, from Resin to de-novo Synthesis*, Journal of Anaesthesia History 3(2)*, p.52

Appendix 3. Example of commercialization of heroin bypharmaceutical industries

Advertising in 1901 for Bayer Pharmaceutical Products. Of interest is Heroin, marketed against cough suppressant and as an effective non-addictive substitute for morphine. Source: https://medium.com/discourse/heroin-was-originally-prescribed-as-a-cough-suppressant-b88192e7aecc accessed on 14th October 2020

Appendix 4. Measures and exceptions for the UN Single Conventionschedules

Control measures and exceptions	Art.	Sch I	Sch II	Sch III	Sch IV
Limitation to medical and scientific purposes The production, manufacture, export, import, distribution of, trade, use and possession have to be limited exclusively to medical and scientific purposes.	4 (c)	✓	✓	✓	✓
Licences and authorisations Governmental licensing is required for participation in any phase of the narcotics trade, namely for manufacture of drugs ; for trade and distribution of drugs . Licensed persons and enterprises as well as the modalities of manufacture, trade and distribution of international trade are to be controlled	29 34 (a) 30 (1)	✓	✓	✓	✓
Import and export authorisations are required for each individual international transaction.	31	✓	✓		✓
Exceptions for all preparations (listed or not listed in Schedule III) For licensed manufacturers of preparations, a periodical permit specifying the kinds and amounts of drugs which they shall be entitled to manufacture, need not be required. For the establishments and premises in which trade or distribution of preparations takes place, licensing need not be required.	29 (2) 30 (1b) (ii)			✓	

Control and inspection Governments must quite generally control all persons and enterprises carrying on or engaged in the manufacture, the trade in or distribution of all drugs, including drugs in Schedule II and III and the retail trade and distribution.		✓	✓	✓	✓
Balance between supply and demand Estimates have to be furnished of future drug requirements for all drugs of the 1961 Convention, namely in respect of the quantities of drugs to be consumed for medical and scientific purposes; quantities of drugs to be utilized for the manufacture of other drugs, of preparations in Schedule III, and of substances not covered by this Convention; stocks of drugs to which the estimates relate; quantities of drugs necessary for addition to special stocks; the number of industrial establishments which will manufacture synthetic drugs and the quantities of synthetic drugs to be manufactured by each of these establishments; Quantities in manufacture and importation, trade and distribution are limited in accordance with the estimates.	19 (1) 21 29 (3) 31 (1b) 30 (2a)	✓	✓	✓	✓
Exception on retail trade With regard to retail trade, there is no obligation to prevent the accumulation of Schedule II-drugs and Schedule III-preparations in the possession of retail distributors, in excess of the quantities required for the normal conduct of business.	2 (2) 30 (6) 30 (2a)		✓	✓	

Control measures and exceptions	Art.	Sch I	Sch II	Sch III	Sch IV
Exception on estimates for preparations (listed or not listed in Schedule III) Estimates shall not be required in the case of preparations in Schedule III, but the estimates of the drug requirements concerning drugs in Schedules I, II and IV must include an estimate of the quantities of drugs to be utilized for the compounding of preparations in Schedule III.	19 (1b)			✓	
Reports Statistical returns have to be furnished to INCB on: (annually): Production or manufacture of drugs; Utilization of drugs for the manufacture of other drugs or preparations; Consumption of drugs; Seizures of drugs; Stocks of drugs; Area of cultivation; (quarterly:) Imports and exports of drugs.	20	✓	✓		✓
The statistical returns (article 20) distinct from those dealing with these drugs shall not be required in the case of such preparations in Schedule III, but the statistical returns for drugs in Schedules I, II and IV must include information on the amounts of drugs actually used for the compounding of Schedule III preparations.	20 (1b)			✓	

Medical prescription A medical prescription is required for the supply or dispensation of drugs to individuals. This requirement does not apply to such drugs that certain individuals may lawfully obtain, use, dispense or administer in connexion with their duly authorized therapeutic functions. Authorized persons engaged in the drug trade and distribution, including manufacturers, wholesale and retail traders, medical practitioners and scientists are entitled to acquire the drugs necessary for the performance of their legal business functions, professions or occupations.	30 (2b)	✓			✓
Exception on medical prescriptions Medical prescriptions for the supply or dispensation to individuals of drugs in Schedules II and III are not obligatory. Such drugs are also exempted from the provision concerning the use of official prescription forms in the shape of counterfoil books issued by the competent governmental authorities or by authorized professional associations. The label under which a drug in Schedules II or III is offered for sale in the retail trade must not show the exact content by weight or percentage.	30 (2) (i) 30 (2b) (ii) 30 (5)		✓	✓	

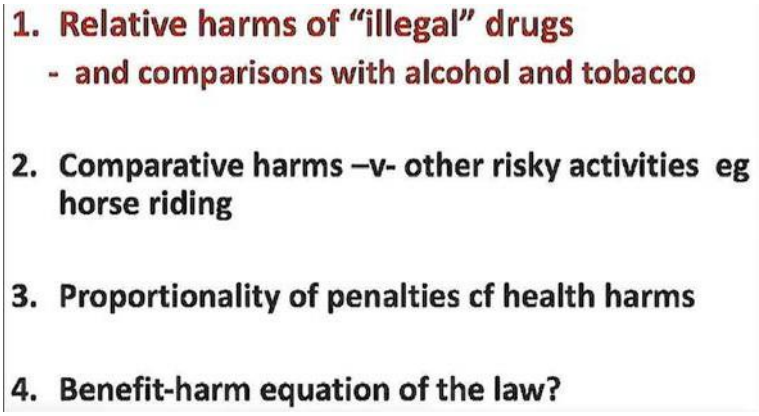
Records All participants in the narcotics trade have to keep detailed records of any transactions in drugs. Medical practitioners (physicians, surgeons, veterinarians and dentists) are not obliged to keep records, neither in respect of drugs in Schedule II nor of those in Schedule I because medical practitioners are not considered "traders".	34 (b)	✓	✓	✓	✓
Exception on records Pharmacists (retail traders) are not obligated to maintain records of their retail sales of drugs in Schedule II and their preparations. The same applies to all preparations in Schedule III, other than those which contain drugs in Schedule I, which the retail traders did not acquire in ready form from manufacturers. However, it appears to be necessary for purposes of control that the retail traders should keep a record of individual sales of preparations in Schedule III which contain drugs in Schedule I and which they compound themselves. They should also maintain records of all individual acquisitions of all drugs and their preparations, including drugs in Schedule II and their preparations as well as all preparations in Schedule III.			✓	✓	

Source: Secretariat to the Governing Bodies CND, July 2019.

https://www.unodc.org/documents/commissions/CND/Scheduling_Resource_Material/Scheduling_Control_Regimes.pdf

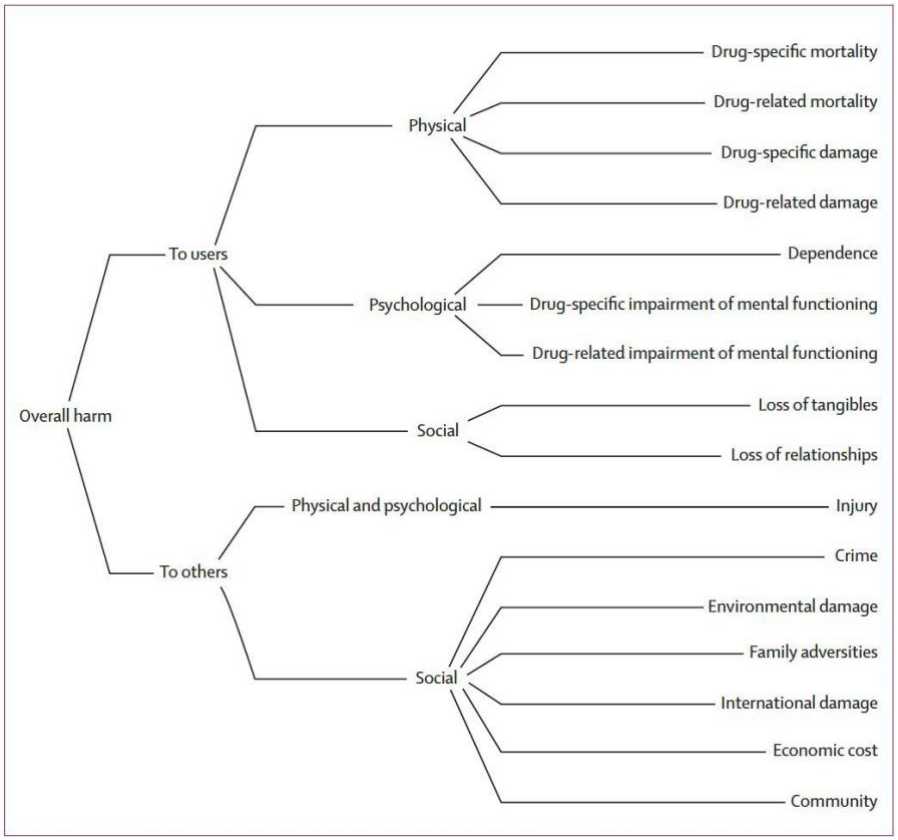
Appendix 5. David Nutt. The other harms for scheduling a drug correctly (3)

(1) Harms of drugs in public policy



Source: David Nutt conference PowerPoint:
https://www.youtube.com/watch?v=8E5depBDKtQ&feature=emb_logo

(2) Evaluation criteria organized by harms to users and harms to others, clustered under physical, psychological and social effects



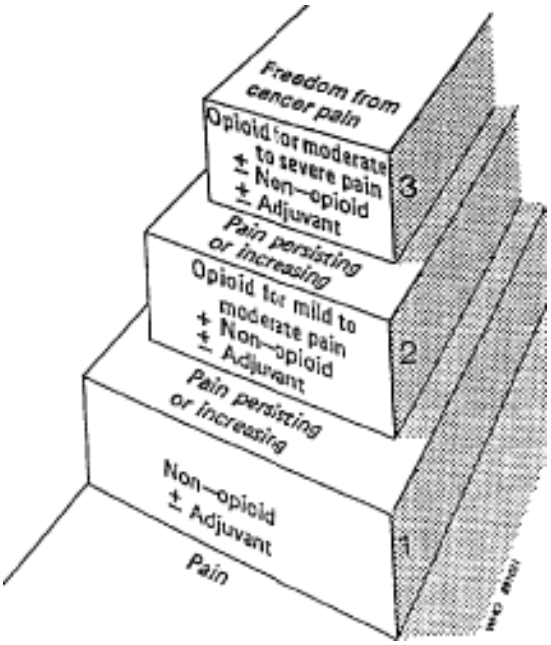
David J Nutt, Leslie A King, Lawrence D Phillips. (2010). Drug harms in the UK: a multicriteria decision analysis, The Lancet, 376, Issue 9752. p.1559.

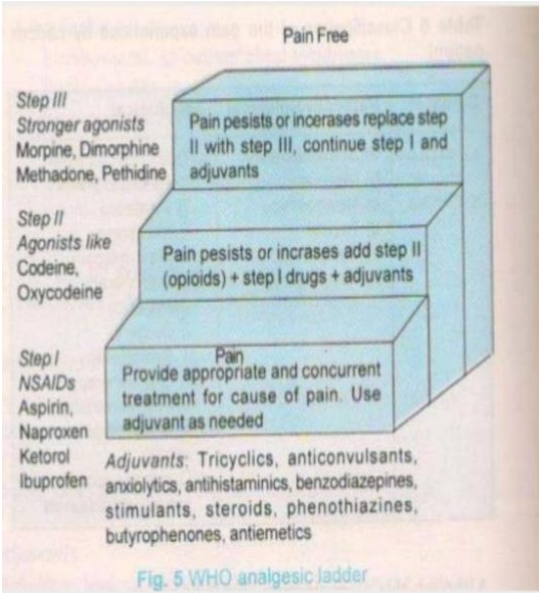
(3) His definitions on drugs

Source: David Nutt conference PowerPoint

https://www.youtube.com/watch?v=8E5depBDKtQ&feature=emb_logo

Appendix 6. The WHO three-step analgesic ladder



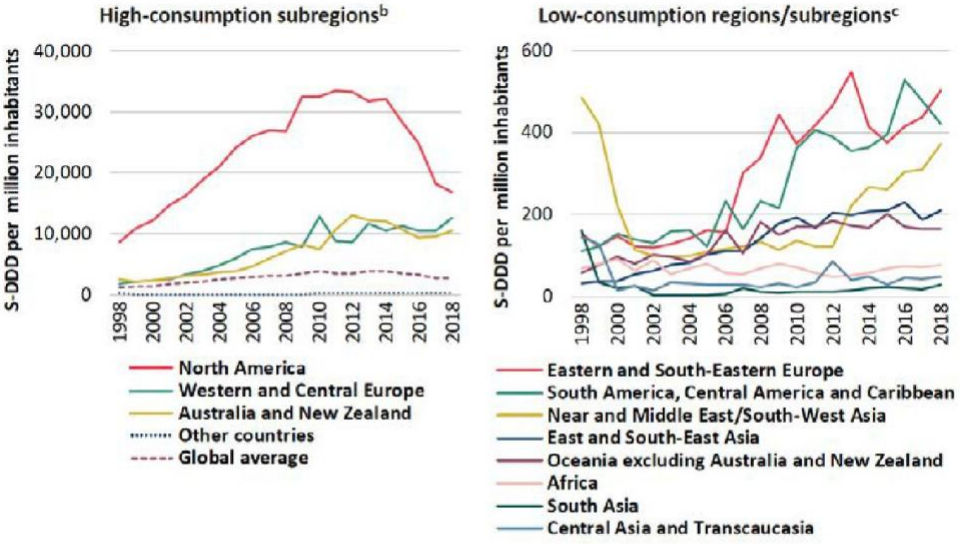


Source: Reid, C., Davies, A. (2004). The World Health Organization three-step analgesicladder comes of age. *Palliative Medicine 18*, p.176.

Appendix 7. UNODC/INCB data for the distribution and consumption of opioids (3)

1)

FIG. 7 Trends in availability of opioid analgesics for medical consumption, by region/subregion,[a] 1998–2018



Source: UNODC calculations based on *Narcotic Drugs 2019: Estimated World Requirements for 2020 – Statistics for 2018* (E/INCB/2019/2) and previous years.

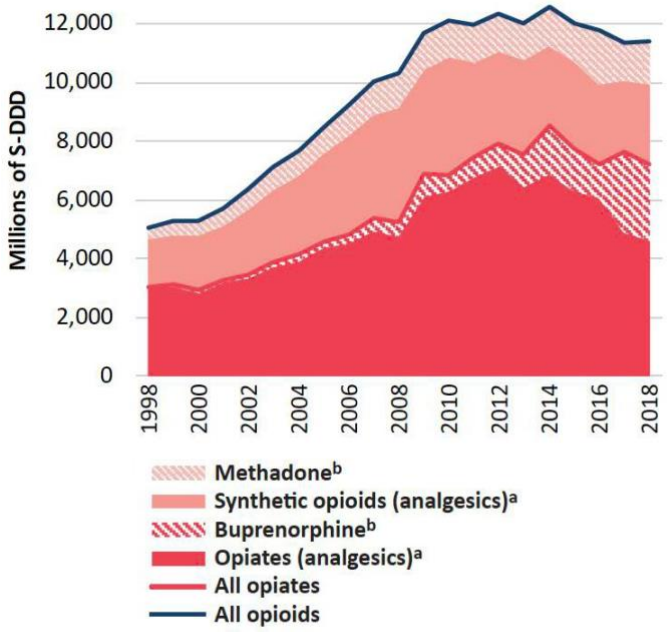
Note: S-DDD refers to "defined daily doses for statistical purposes" as defined by INCB. S-DDDs are "technical units of measurement" for the purposes of statistical analysis and are not recommended daily prescription doses; actual doses may differ based on treatments required and medical practices. Details of S-DDDs used for these calculations are provided in the methodological annex of the present report.

[a] *Subregions and regions according to the classification used by UNODC in the World Drug Report; subregions and regions as defined partly differ from those used by INCB in its publications; extrapolation techniques have been used in case of missing data.*

[b] *Includes subregions above the global average, i.e., North America, Western and Central Europe, Australia and New Zealand.*

[c] *Includes regions and or subregions below the global average, i.e., Africa, Asia, Eastern Europe, South-Eastern Europe, the Caribbean, Central America and South America, as well as Melanesia, Micronesia and Polynesia, i.e., all regions and subregions except those of North America, Western and Central Europe, and Australia and New Zealand.*

2) **FIG. 1** Global amounts available for medical consumption of pharmaceutical opioids under international control, 1998–2018

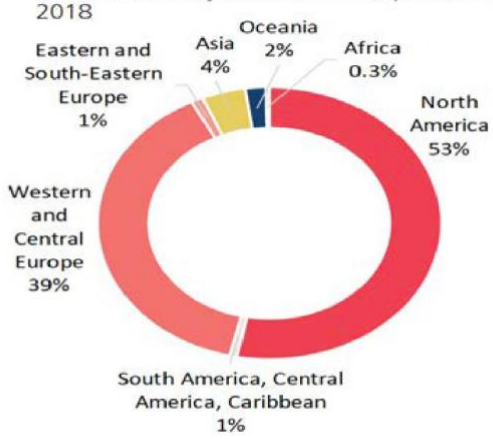


Source: *Narcotic Drugs 2019: Estimated World Requirements for 2020 – Statistics for 2018* (E/INCB/2019/2).

Note: S-DDD refers to "defined daily doses for statistical purposes" as defined by INCB. S-DDDs are "technical units of measurement" for the purposes of statistical analysis and are not recommended daily prescription doses; actual doses may differ based on treatments required and medical practices. The statistics exclude preparations of opioids listed in Schedule III of the 1961 Convention. Details of S-DDDs used for these calculations are provided in the methodological annex of the present report.

[a] *Substances used as analgesics, i.e., excluding substances used in opioid substitution treatment.*
[b] *Substances used in opioid substitution treatment and as analgesics.*

3) **FIG. 3** Distribution of amounts available for medical consumption of codeine, fentanyl, morphine, pethidine and other opioids, expressed in standard defined daily doses (S-DDD), per subregion, 2018



Source: UNODC calculations based on *Narcotic Drugs 2019: Estimated World Requirements for 2020 – Statistics for 2018* (E/INCB/2019/2).

Note: S-DDD refers to "defined daily doses for statistical purposes" as defined by INCB. S-DDDs are "technical units of measurement" for the purposes of statistical analysis and are not recommended daily prescription doses; actual doses may differ based on treatments required and medical practices. Details of S-DDDs used for these calculations are provided in the methodological annex of the present report.

Appendix 8. Traditional harvest methods (4)

1. Tools for opium harvest with dried ripped poppies pods

Source: https://www.deamuseum.org/ccp/opium/production-distribution.html

2. Opium poppy pod ripped – fresh latex oozing out

Source :https://c2.staticflickr.com/6/5236/5894460512_64be406a6d_z.jpg

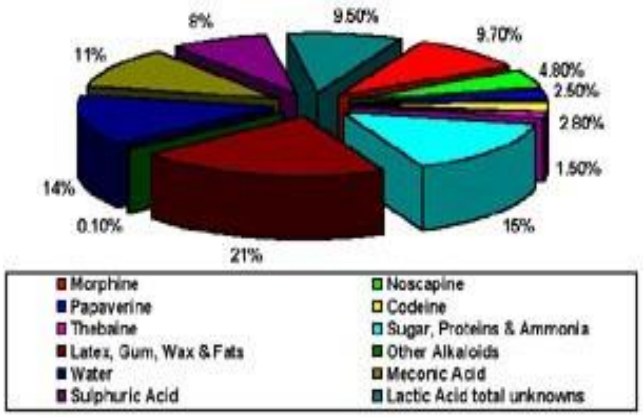
3. Opium poppy pod ripped – dried latex getting harvested

Source : https://i.dawn.com/primary/2017/08/598979aae24e1.jpg

4. Legal opium gum-resin- sap dried and ready to be shipped

Source : https://www.deamuseum.org/ccp/opium/production-distribution.html

Appendix 9. Indian opium sap content



Source : http://cbn.nic.in/html/opiumcbn.htm

Appendix 10. One-page extract of de-licensed cultivators in one facility based in one region, for the year 2020-2021 in India

S* N$*	U%(+,! C$-! $& C,./(0"/$'	NAME OF DISTRICT	NAME OF TEHSIL	NAME OF VILLAGE	NAME OF CULTIVATOR	R!"#$% &$' D!-L()!%#!
32	03010517021 091	BARE LLY	AONLA	M LK MASARA	RAJESH KUMAR/ RAM PAL	MQY-M Be ow 4 2
33	03010517091 023	BARE LLY	AONLA	MUTLAKPUR	JAY LAL/ OLE	Thef / M!""!#$ %&'"(e"
34		BARE LLY	AONLA	NAKATPUR	SHANT)E* / * REN)RA PAL +* REN)RA PAL S N,H/ ,OKRAN S N,H-	Thef / M!""!#$ %&'"(e"
3.	03010517180 014	BARE LLY	AONLA	NATTHE K ,OT YA	JAMUNA)E* /KUN)AN	MQY-M Be ow 4 2
3/	03010517183 005	BARE LLY	AONLA	NAU,A0AN THAKURAN	SHANT)E* / NATTHU LAL +NATTHULAL / NANHKU-	Thef / M!""!#$ %&'"(e"
31	03010517183 045	BARE LLY	AONLA	NAU,A0AN THAKURAN	SH *RAJ / KOM L	Thef / M!""!#$ %&'"(e"
32	03010517101 039	BARE LLY	AONLA	PYAS	PREM PAL / SEETA RAM +K SHAN)E / SEETA RAM-	MQY-M Be ow 4 2
33	03010517101 046	BARE LLY	AONLA	PYAS	PAT RAM/BHA)A +KAN)HA / NATTHU-	MQY-M Be ow 4 2
44	03010517104 012	BARE LLY	AONLA	RAMNA,AR	N RANJAN/ LEELA)HAR +LEELA)HR/ RAM K SHAN-	Thef / M!""!#$ %&'"(e"
45	03010517027 063	BARE LLY	AONLA	SAKARPUR	H RALAL/ NANKU LAL	Thef / M!""!#$ %&'"(e"
42	03010517030	BARE LLY	AONLA	S N, HA	SH * KUMAR S N,H/ RAKSHPAL S N, H	MQY-M Be ow 4 2
43	03010517115 013	BARE LLY	AONLA	S RAUL KHAS	AN SHA BE, UM/JA6AR AL +JA6AR AL / KAL BE-	MQY-M Be ow 4 2
44	03010517115 017	BARE LLY	AONLA	S RAUL KHAS	*EER S N, H /)ESHRAJ +)ESHRAJ/ BEN RAM-	MQY-M Be ow 4 2
4.	03010517115 044	BARE LLY	AONLA	S RAUL KHAS	, YANESH KUMAR T OAR / SUN)ER LAL +SUN)AR LAL/ MATRULAL-	MQY-M Be ow 4 2
4/	03010411009 035	BA)AUN	BA)AUN	6AR)PUR %HAKOL	BAHORAN LAL/ SHORU S N, H	Thef / M!""!#$ %&'"(e"
41	03010411009 022	BA)AUN	BA)AUN	6AR)PUR %HAKOL	KALYAN/ MOOL%HAN)	Thef / M!""!#$ %&'"(e"
42	03010411010 008	BA)AUN	BA)AUN	, ABH YA NA,LA	SHAR)A)E* / BEN RAM	Thef / M!""!#$ %&'"(e"
43	03010411059 007	BA)AUN	BA)AUN	,AURAMA	MOHAMMA) AHAMA)/ SAUKAT KHAN +SAUKAT KHAN/ %HAN) KHAN-	Thef / M!""!#$ %&'"(e"
.4	03010411014 008	BA)AUN	BA)AUN	ML YA	%HHOTE LAL/ MANOHAR S N,H	Thef / M!""!#$ %&'"(e"
.5	03010411015 010	BA)AUN	BA)AUN	NAYAT,ANJ	ANOKHE/ , AUR	Thef / M!""!#$ %&'"(e"
.2	03010411015 012	BA)AUN	BA)AUN	NAYAT,ANJ	%HETRAM/ MATHURA PRASA) +MATHURA PRASA)/ SUN)AR	MQY-M Be ow 4 2
.3	03010411016 021	BA)AUN	BA)AUN	SLAM,ANJ	L YAKAT/ SAKRU)) N	Thef / M!""!#$ %&'"(e"
.4	03010411016 010	BA)AUN	BA)AUN	SLAM, ANJ	LAJJARAM/ NANHE LAL	MQY-M Be ow 4 2
..	03010411017 019	BA)AUN	BA)AUN	JAKHA L	LAL BAHA)UR/ JHABBU LAL	Thef / M!""!#$ %&'"(e"
./	03010411063 081	BA)AUN	BA)AUN	KAT NNA	OMPAL/)HAN S N, H	Thef / M!""!#$ %&'"(e"
.1		BA)AUN	BA)AUN	KUOATAN)A	RAMESHOAR / BABURAM	MQY-M Be ow 4 2
.2	03010411032 031	BA)AUN	BA)AUN	NAA	RAM LAL / RAMES0AR +RAMESHOAR UR6 KALYAN/ MEEHLAL-	MQY-M Be ow 4 2
.3	03010411033 009	BA)AUN	BA)AUN	NA)AUL YA	PAPPU/ MAKHAN +MAKKHAN/ HURMAT-	Thef / M!""!#$ %&'"(e"
/4	03010413004 089	BA)AUN	B LS	BA RMA	RAM%HARAN/ HOR LAL	MQY-M Be ow 4 2
/5	03010413022 013	BA)AUN	B LS	KUN)A0AL	, AN, A S N, H/*)ERAM	MQY-M Be ow 4 2
/2	03010413022 005	BA)AUN	B LS	KUN)A0AL	KR SHAN LAL/ BHA, OAT +BHA,OAT/B HAR -	MQY-M Be ow 4 2
/3	03010411059 002	BA)AUN	B LS	RA PUR MAJHARA	BALBANT / SH * LAL	MQY-M Be ow 4 2
/4	03010413016 020	BA)AUN	B LS	R SAUL KHAAS	PUROSHOTTAM/ ME0ARAM	MQY-M Be ow 4 2

Source : http://cbn.nic.in/html/ineligible.html

Appendix 11. Steps in the opium cultivation and heroin manufacture process

Location	Processing step	Product	(a) Special chemicals used (b) Output quantity
Opium poppy field	Step 1	Opium plant	(a) none
		Dried opium latex	(b) 500 hectares of poppy plants produce 10,000 kilograms or 10 tonnes of "dried opium latex"
Opium lab	Step 2	Morphine base (morphine hydrochloride)	(a) hot water, calcium oxide (lime), ammonium chloride
			(b) 10 tonnes of dried opium latex yield 1 tonne of "morphine base"
Heroin lab	Step 3a	Diacetylmorphine	(a) acetic anhydride, chloroform, sodium bicarbonate (baking soda)
	Step 3b	Brown heroin base	(b) 1 tonne of morphine base yields 1 tonne of "diacetylmorphine"; 1 tonne of diacetylmorphine yields 1 tonne of "brown heroin base"
	Step 4	White heroin base	(a) hydrochloric acid, activated charcoal, ammonia solution
			(b) 1 tonne of brown heroin base yields 1 tonne of "white heroin base"
	Step 5	White heroin hydrochloride (No. 4 heroin)	(a) hydrochloric acid, acetone
			(b) 1 tonne of white heroin base yields 1 tonne of "No. 4 heroin"

Notes: (1) one metric tonne = 1,000 kilograms (kg). (2) Sources: Zerell, Ahrens, and Gerz (2005) and Opium - Poppy Cultivation, Morphine and Heroin Manufacture (2016). (3) The overall output from Step 1 to Step 5 is: 10 tonnes of opium (i.e. dried opium latex) yields 1 tonne of heroin (i.e. No. 4 heroin).

Source: Miltenburg, J. (2018). Supply chains for illicit products: Case study of the global opiate production networks. Cogent Business & Management

Appendix 12. Extract of most-favored nation tariffs data in 2016-2020

HS MFN - Simple average ad valorem duty (Percent)

Reporting Economy	Product/Sector	Year ←	2016	2017	2018	2019 ↓	2020
Korea, Republic of	HS - 130219 - Other		128.4	128.4	128.4	128.4	128.4
India	HS - 120791 - Poppy seeds		20	20	70	70	
Papua New Guinea	HS - 130211 - Opium		40	40	40	40	
Turkey	HS - 121190 - Other		28.9			35	
	HS - 121140 - Poppy straw		35			35	
Cuba	HS - 130211 - Opium		30	30	30	30	30
	HS - 293919 - Other		30	30	30	30	30
India	HS - 130211 - Opium		30	30	30	30	
	HS - 130219 - Other		15	15	30	30	
	HS - 121190 - Other		15	15	30	30	
	HS - 121140 - Poppy straw		15	15	30	30	
Cuba	HS - 293911 - Concentrates of poppy straw; buprenorphine (INN), codeine, dihydrocodeine (INN), ethylmorphine, etorphine (INN), heroin, hydrocodone (INN), hydromorphone (INN), morphine, nicomorphine (INN), oxycodone		30	30	30	30	30
Thailand	HS - 120791 - Poppy seeds		30	30	30	30	30
Jordan	HS - 120791 - Poppy seeds		30	30	30	30	
	HS - 130211 - Opium		30	30	30	30	
Thailand	HS - 130211 - Opium		27	27	27	27	27

Appendix

Reporting Economy	Product/Sector	Year ←	2016	2017	2018	2019 ↓	2020
Jordan	HS - 121140 - Poppy straw		10	10	15	15	
	HS - 130219 - Other		15	15	15	15	
Maldives	HS - 293911 - Concentrates of poppy straw; buprenorphine (INN), codeine, dihydrocodeine (INN), ethylmorphine, etorphine (INN), heroin, hydrocodone (INN), hydromorphone (INN), morphine, nicomorphine (INN), oxycodone		15	15		15	
Myanmar	HS - 130219 - Other			12.6	12.6	12.6	12.6
North Macedonia	HS - 121190 - Other		10	12.5	12.5	12.5	12.5
Namibia	HS - 130211 - Opium		12	12	12	12	12
Botswana	HS - 130211 - Opium		12	12	12	12	12
Eswatini	HS - 130211 - Opium		12	12	12	12	12
South Africa	HS - 130211 - Opium		12	12	12	12	12
Lesotho	HS - 130211 - Opium		12	12	12	12	12
	HS - 130219 - Other		11	11	11	11	13.3
Eswatini	HS - 130219 - Other		11	11	11	11	13.3
Namibia	HS - 130219 - Other		11	11	11	11	13.3
South Africa	HS - 130219 - Other		11	11	11	11	13.3
Botswana	HS - 130219 - Other		11	11	11	11	13.3
Gabon	HS - 293919 - Other		10			10	

Reporting Economy	Product/Sector	Year ←	2016	2017	2018	2019 ↓	2020
Maldives	HS - 130219 - Other		25	25		25	
	HS - 130211 - Opium		25	25		25	
Comoros	HS - 130211 - Opium		20	20	20	20	
	HS - 120791 - Poppy seeds		20	20	20	20	
	HS - 121140 - Poppy straw		20	20	20	20	
	HS - 121190 - Other		20	20	20	20	
China	HS - 120791 - Poppy seeds		20	20	20	20	20
Comoros	HS - 293919 - Other		20	20	20	20	
	HS - 293911 - Concentrates of poppy straw; buprenorphine (INN), codeine, dihydrocodeine (INN), ethylmorphine, etorphine (INN), heroin, hydrocodone (INN), hydromorphone (INN), morphine, nicomorphine (INN), oxycodone		20	20	20	20	
	HS - 130219 - Other		20	20	20	20	
Cambodia	HS - 121190 - Other		32.8	32.8		15.9	15.9
	HS - 120791 - Poppy seeds		15	15		15	15
	HS - 130211 - Opium		15	15		15	15
	HS - 130219 - Other		15	15		15	15
Maldives	HS - 293919 - Other		15	15		15	
Cambodia	HS - 121140 - Poppy straw		15	35		15	15
Thailand	HS - 293911 - Concentrates of poppy straw; buprenorphine (INN), codeine, dihydrocodeine (INN), ethylmorphine, etorphine (INN), heroin, hydrocodone (INN), hydromorphone (INN), morphine, nicomorphine		15	15	15	15	15

Source : WTO database :https://data.wto.org/?idSavedQuery=c99f41cb-e8f7-4a47-8542-01fffebe868a accessed on December 20th, 2020.

Appendix 12. List of countries applying the Harmonized System (WCO)

1 October 2020

List of 212 countries, territories or customs or economic unions applying the Harmonized System.

160 Contracting Parties (159 countries and the European Union)

Afghanistan (Islamic Republic of)	x	Eswatini	+
Albania	+	Ethiopia	+
Algeria	+	Fiji	+
Andorra	+	Finland	+
Angola	+	France	+
Antigua and Barbuda	x	Gabon	+
Argentina	+	Gambia	+
Armenia	+	Georgia	+
Australia	+	Germany	+
Austria	+	Ghana	+
Azerbaijan	+	Greece	+
Bahamas	+	Grenada	x
Bahrain	+	Guatemala	+
Bangladesh	+	Guinea	+
Barbados	x	Guinea-Bissau	+
Belarus	+	Guyana	x
Belgium	+	Haiti	+
Belize	x	Honduras	x
Benin	+	Hong Kong, China	x
Bermuda	x	Hungary	+
Bhutan	+	Iceland	+
Bolivia	+	India	+
Bosnia and Herzegovina	+	Indonesia	+
Botswana	+	Iran (Islamic Republic of)	+
Brazil	+	Iraq	x
Brunei Darussalam	+	Ireland	+
Bulgaria	+	Israel	+
Burkina Faso	+	Italy	+
Burundi	+	Jamaica	x
Cambodia	+	Japan	+
Cameroon	+	Jordan	+
Canada	+	Kazakhstan	+
Cape Verde	+	Kenya	+
Central African Republic	+	Kiribati	x
Chad	+	Korea (Republic of)	+
Chile	+	Kosovo	+
China	+	Kuwait	+
Colombia	+	Kyrgyzstan	+
Comoros	+	Lao People's Democratic Republic	x
Congo (Republic of the)	+	Latvia	+
Cook Islands	x	Lebanon	+
Costa Rica	+	Lesotho	+
Côte d'Ivoire	+	Liberia	+
Croatia	+	Libya	+
Cuba	+	Liechtenstein	x
Curacao	x	Lithuania	+
Cyprus	+	Luxembourg	+
Czech Republic	+	Macau, China	x
Democratic Republic of the Congo	+	Madagascar	+
Denmark	+	Malawi	+
Djibouti	+	Malaysia	+
Dominica	x	Maldives	+
Dominican Republic	+	Mali	+
Ecuador	+	Malta	+
Egypt	+	Marshall Islands	x
El Salvador	x	Mauritius	+
Equatorial Guinea	x	Mauritania	+
Eritrea	+	Mexico	+
Estonia	+	Micronesia	x

Appendix

1 October 2020

Moldova	+	Sri Lanka	+
Mongolia	+	Sudan	+
Montenegro	+	Suriname	x
Morocco	+	Sweden	+
Mozambique	+	Switzerland	+
Namibia	+	Syrian Arab Republic	+
Nepal	+	Tajikistan	+
Netherlands	+	Tanzania	+
New Caledonia (French Terr.)	x	Thailand	+
New Zealand	+	Timor-Leste	x
Nicaragua	x	Togo	+
Niger	+	Tonga	x
Nigeria	+	Trinidad and Tobago	x
Niue	x	Tunisia	+
North Macedonia	+	Turkey	+
Norway	+	Turkmenistan	x
Oman	+	Tuvalu	x
Pakistan	+	Uganda	+
Palau	x	Ukraine	+
Palestine	+	Union of Myanmar (Republic of the)	+
Panama	+	United Arab Emirates	+
Papua New Guinea	+	United Kingdom	+
Paraguay	+	United States	+
Peru	+	Uruguay	+
Philippines	+	Uzbekistan	+
Poland	+	Vanuatu	+
Polynesia (French Terr.)	x	Venezuela	+
Portugal	+	Viet Nam	+
Qatar	+	Wallis and Futuna (French Terr.)	x
Romania	+	Yemen	+
Russian Federation	+	Zambia	+
Rwanda	+	Zimbabwe	+
Saint Kitts and Nevis	x	European Union (EU)	+
Saint Lucia	x		
Saint Pierre and Miquelon (French Terr.)	x	Andean Community (CAN)	+x
Saint Vincent and the Grenadines	x	Caribbean Community (CARICOM)	+x
Samoa	x	Common Market for Eastern and Southern Africa (COMESA)	+x
Sao Tome and Principe	+	Commonwealth of the Independent States (CIS)	+x
Saudi Arabia	+	Economic and Monetary Community of Central Africa (CEMAC)	+x
Senegal	+	Economic Community of Western African States (ECOWAS)	+x
Serbia	+	Gulf Co-operation Council (GCC)	+x
Seychelles	+	Latin American Integration Association (LAIA)	+x
Sierra Leone	+	Southern Cone Common Market (MERCOSUR)	+x
Singapore	+	West African Economic and Monetary Union (UEMOA)	+x
Slovakia	+		
Slovenia	+		
Solomon Islands	x		
Somalia	x		
South Africa	+		
South Sudan	x		
Spain	+		

Notes :

+ Acceptance (i.e., Contracting Party to the Harmonized System Convention).

x Indicates application only.

+x Some Members are Contracting Parties to the Harmonized System Convention.

The two pictures represent the list of all contracting parties to the Harmonized System Convention. Please see the notes (+/x/+x) to read correctly the table. This table was found on: http://www.wcoomd.org/-/media/wco/public/global/pdf/topics/nomenclature/overview/hs-contracting-parties/list- of-countries/countries_applying_hs.pdf?db=web

Appendix 13. Highlighted parts chapter 13 of the Harmonized System

Chapter 13

Lac; gums, resins and other vegetable saps and extracts

Note.

1.- Heading 13.02 applies, *inter alia*, to liquorice extract and extract of pyrethrum, extract of hops, extract of aloes and opium.

The heading does not apply to :

(a) Liquorice extract containing more than 10 % by weight of sucrose or put up as confectionery (heading 17.04);

(b) Malt extract (heading 19.01);

(c) Extracts of coffee, tea or maté (heading 21.01);

(d) Vegetable saps or extracts constituting alcoholic beverages (Chapter 22);

(e)Camphor, glycyrrhizin or other products of heading 29.14 or 29.38;

(f)Concentrates of poppy straw containing not less than 50 % by weight of alkaloids (heading 29.39);

(g) Medicaments of heading 30.03 or 30.04 or blood-grouping reagents (heading 30.06);

(h) Tanning or dyeing extracts (heading 32.01 or 32.03);

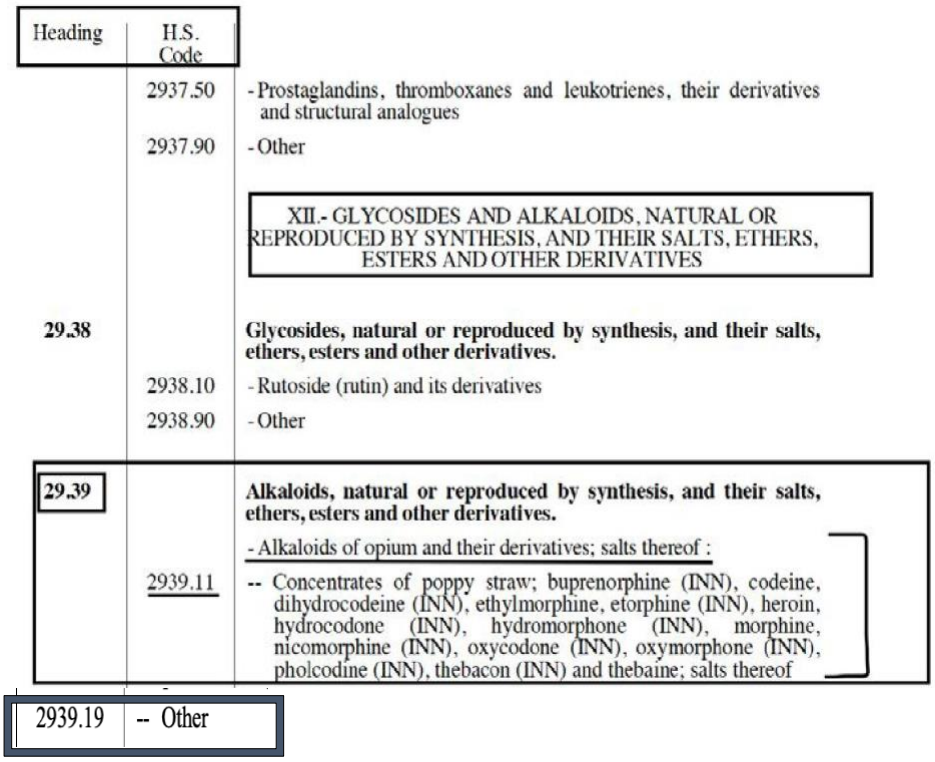
(ij) Essential oils, concretes, absolutes, resinoids, extracted oleoresins, aqueous distillates or aqueous solutions of essential oils or preparations based on odoriferous substances of a kind used for the manufacture of beverages (Chapter 33); or

(k) Natural rubber, balata, gutta-percha, guayule, chicle or similar natural gums (heading 40.01).

Heading	H.S. Code	
13.01		**Lac; natural gums, resins, gum-resins and oleoresins (for example, balsams).**
	1301.20	- Gum Arabic
	1301.90	- Other
13.02		**Vegetable saps and extracts; pectic substances, pectinates and pectates; agar-agar and other mucilages and thickeners, whether or not modified, derived from vegetable products.**
		- Vegetable saps and extracts :
	1302.11	-- Opium
	1302.12	-- Of liquorice
	1302.13	-- Of hops
	1302.14	-- Of ephedra
	1302.19	-- Other
	1302.20	- Pectic substances, pectinates and pectates
		- Mucilages and thickeners, whether or not modified, derived from vegetable products :
	1302.31	-- Agar-agar
	1302.32	-- Mucilages and thickeners, whether or not modified, derived from locust beans, locust bean seeds or guar seeds
	1302.39	-- Other

The title, the note (f), the heading and H.S. code, the 13.02 and 1302.11and 1302.19 have been highlighted by me. Source: http://www.wcoomd.org/-/media/wco/public/global/pdf/topics/nomenclature/instruments-and-tools/hs- nomenclature-2017/2017/0213_2017e.pdf?la=en

Appendix 14. Highlighted parts of chapter 29 of the Harmonized System



Heading	H.S. Code	
	2937.50	- Prostaglandins, thromboxanes and leukotrienes, their derivatives and structural analogues
	2937.90	- Other
		XII.- GLYCOSIDES AND ALKALOIDS, NATURAL OR REPRODUCED BY SYNTHESIS, AND THEIR SALTS, ETHERS, ESTERS AND OTHER DERIVATIVES
29.38		**Glycosides, natural or reproduced by synthesis, and their salts, ethers, esters and other derivatives.**
	2938.10	- Rutoside (rutin) and its derivatives
	2938.90	- Other
29.39		**Alkaloids, natural or reproduced by synthesis, and their salts, ethers, esters and other derivatives.**
		- Alkaloids of opium and their derivatives; salts thereof :
	2939.11	-- Concentrates of poppy straw; buprenorphine (INN), codeine, dihydrocodeine (INN), ethylmorphine, etorphine (INN), heroin, hydrocodone (INN), hydromorphone (INN), morphine, nicomorphine (INN), oxycodone (INN), oxymorphone (INN), pholcodine (INN), thebacon (INN) and thebaine; salts thereof
	2939.19	-- Other

Source:http://www.wcoomd.org/-/media/wco/public/global/pdf/topics/nomenclature/instruments-and-tools/hs-nomenclature-2017/2017/0629_2017e.pdf?la=en

Appendix 15. Correlation document produced by the WCO betweenthe international conventions and the harmonized system

II. LIST OF CONVENTIONS AND THEIR ORGANIZATIONS

ORGANIZATIONS	CONVENTIONS, ETC.	Header in the Table
INCB (Vienna)	- Single Convention on narcotic drugs, 1961, as amended by the 1972 Protocol - Convention on psychotropic substances (1971) - Convention against illicit traffic in narcotics drugs and psychotropic substances, 1988 - CND Resolution 49/3	NARCOTICS
WTO (Geneva)	- Instrument on pharmaceutical products	INN

Code SH HS Code	DECHETS A-I WASTE A-I	DECHETS A-II WASTE A-II	DECHETS B-I WASTE B-I	DECHETS B-II WASTE B-II	OZONE	CITES	STUPEFIANTS NARCOTICS	CAC CWC	AERONEFS CIVILS CIVIL AIRCRAFT	DCI INN	ROTTERDAM/ STOCKHOLM
0505.90	EX			EX		EX					
0506.10						EX					
0506.90	EX			EX		EX					
0507.10				EX		EX					
0507.90				EX		EX					
0508.00				EX		EX					
0510.00						EX					
0511.91						EX					
0511.99	EX		EX	EX		EX					
0601.10						EX					
0601.20						EX					
0602.10						EX					
0602.20						EX					
0602.90						EX					
0604.20						EX					
0604.90						EX					
1209.99						EX					
1211.20						EX					
1211.30							X				
1211.40							X				
1211.50							X				
1211.90						EX	EX				
1213.00	EX			EX							
1301.90							EX				
1302.11							X				
1302.14							X				
1302.19						EX	EX				
1401.00	EX										
1404.90				EX							

1302.11 refers to opium sap

Code SH HS Code	DECHETS A-I WASTE A-I	DECHETS A-II WASTE A-II	DECHETS B-I WASTE B-I	DECHETS B-II WASTE B-II	OZONE	CITES	STUPEFIANTS NARCOTICS	CAC CWC	AERONEFS CIVILS CIVIL AIRCRAFT	DCI INN	ROTTERDAM/ STOCKHOLM
2937.12										EX	
2937.19										EX	
2937.21										EX	
2937.22										EX	
2937.23										EX	
2937.29										EX	
2937.50										EX	
2937.90										EX	
2938.10										EX	
2938.90										EX	
2939.11							X			EX	
2939.19							EX			EX	
2939.20							EX			EX	
2939.41							X			EX	
2939.42							X			EX	
2939.43							X			EX	
2939.44							X			EX	
2939.49										EX	
2939.51							X			EX	
2939.59							EX			EX	
2939.61							X			EX	
2939.62							X			EX	
2939.63							X				
2939.69							EX			EX	
2939.71							X			EX	
2939.79							EX			EX	
2939.80										EX	
2940.00										EX	
2941.10										EX	

2939.11: refers to alkaloids of opium and their derivatives
while
2939.19: refers to "other"

Notes :

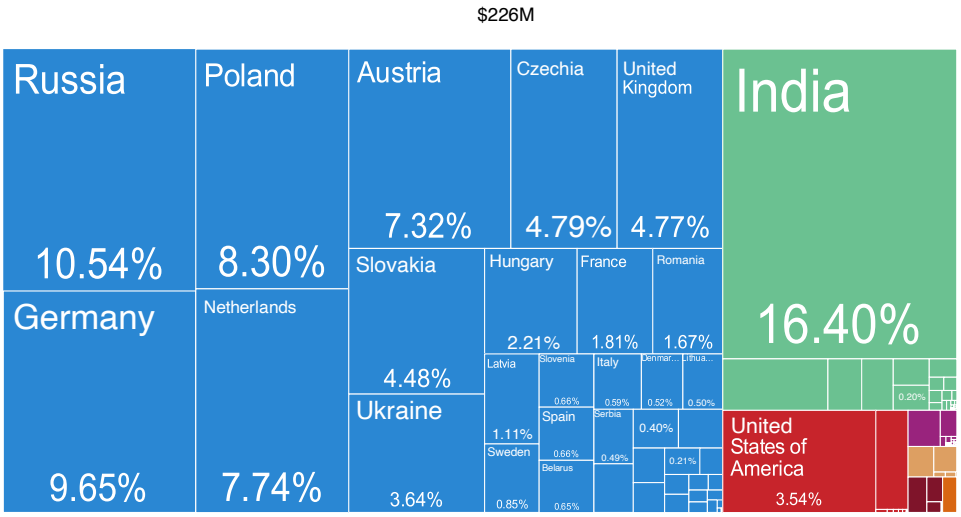
1. The "HS Code" column in the Table lists only the HS codes covered by one (or more) convention(s).

2. The symbol "X" in the Table indicates full coverage, which means that all goods of the specified subheading are controlled by the convention mentioned in the header of the corresponding column, while "EX" indicates partial coverage.

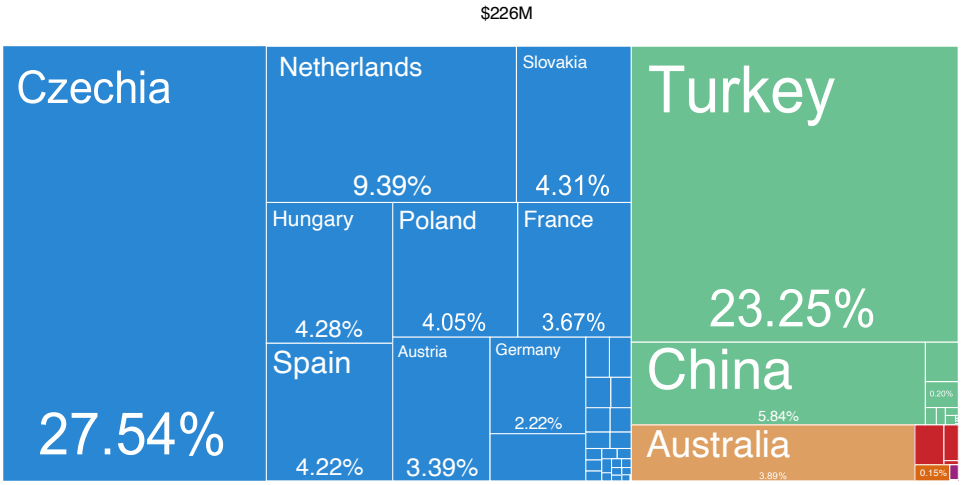
Source :https://http//www.wcoomd.org/-/media/wco/public/global/pdf/topics/nomenclature/instruments-%20and-%20tools/interconnections/interconnection-table.pdf?la=en

Appendix 16. Imports-Export opium commodities (Harvard Atlas Database)

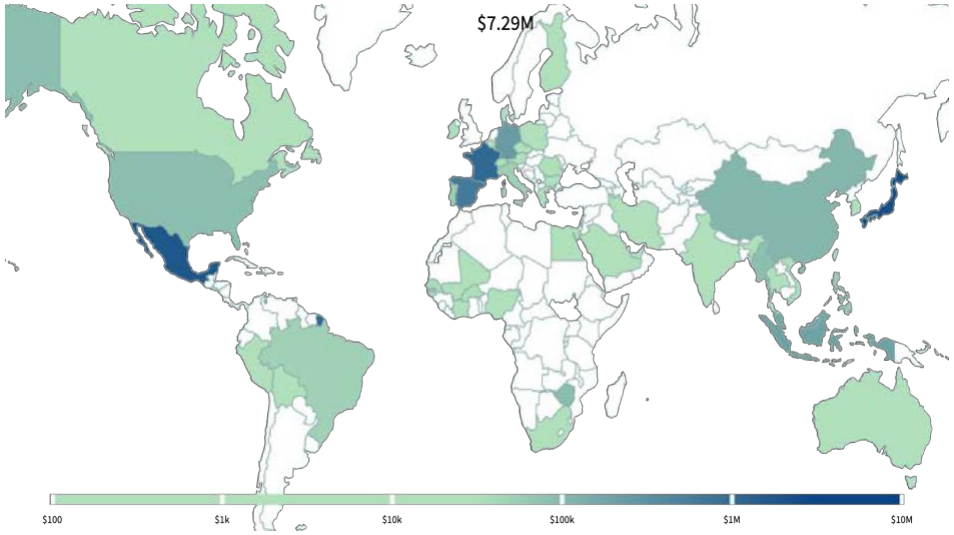
Imports 2018 of poppy seeds



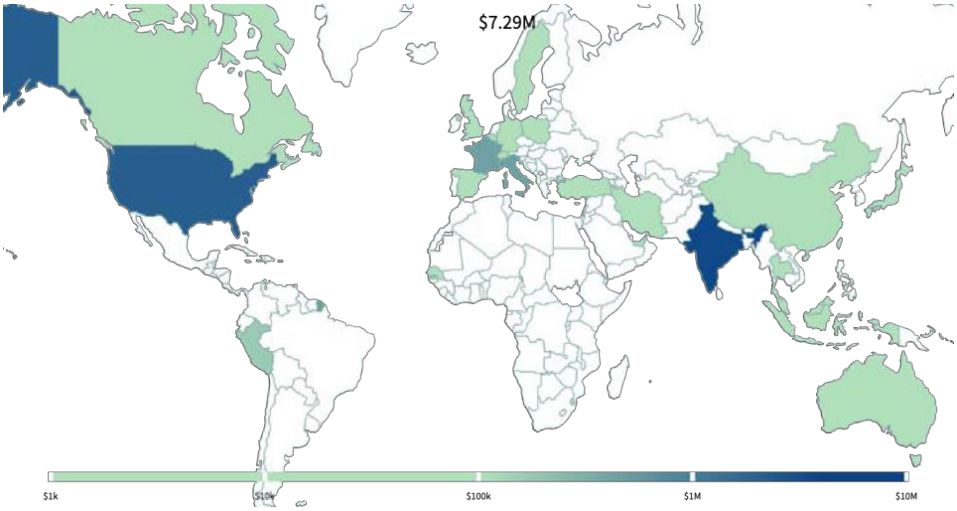
Exports 2018 of poppy seeds



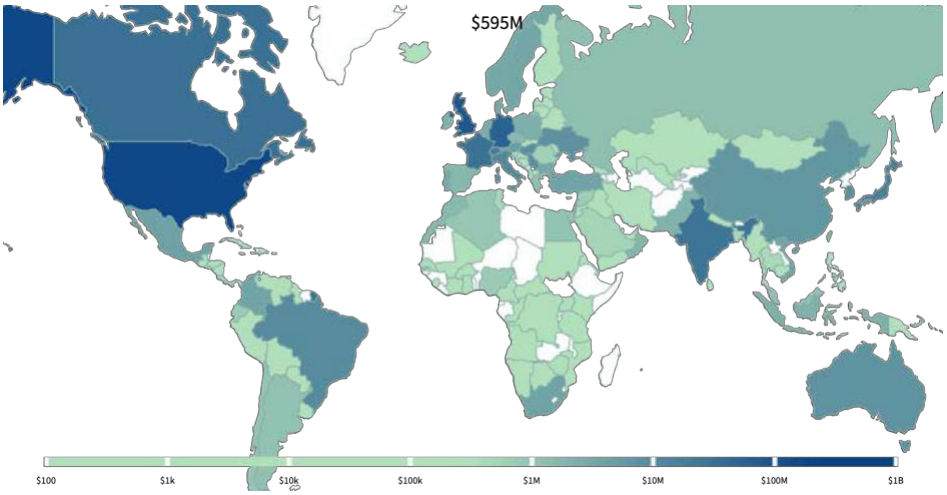
Import of opium sap in 2018



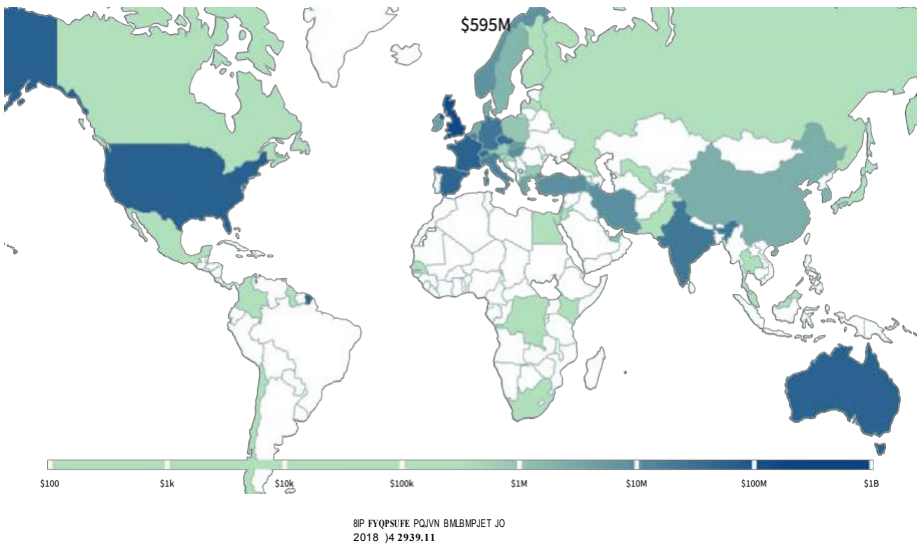
Export of opium sap in 2018



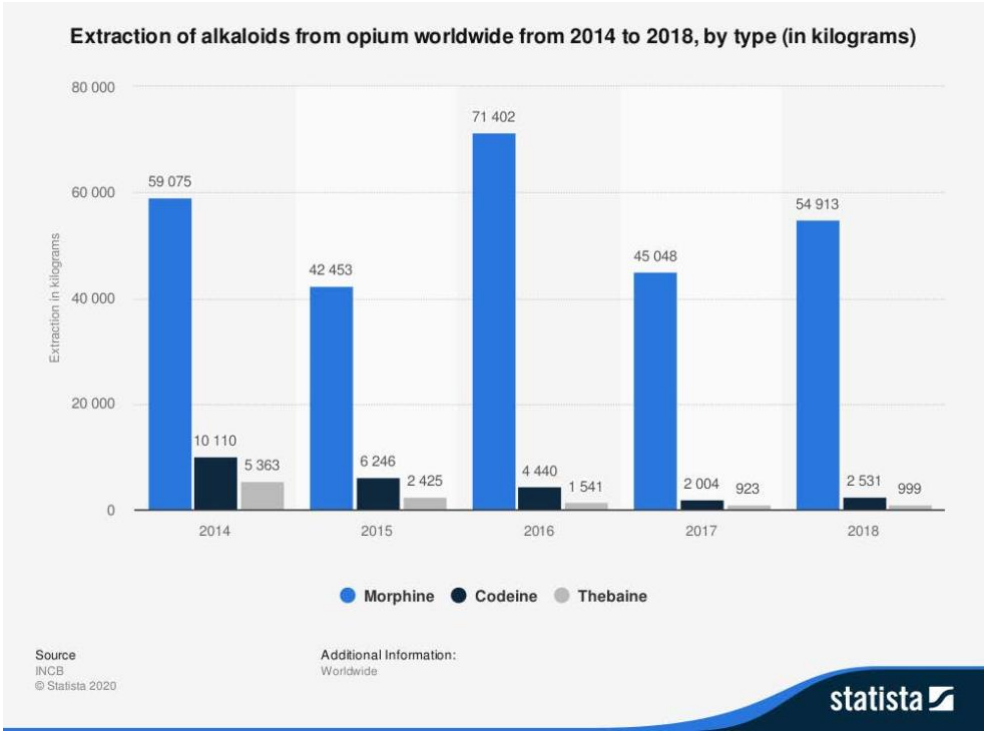
Import opium alkaloids 2018



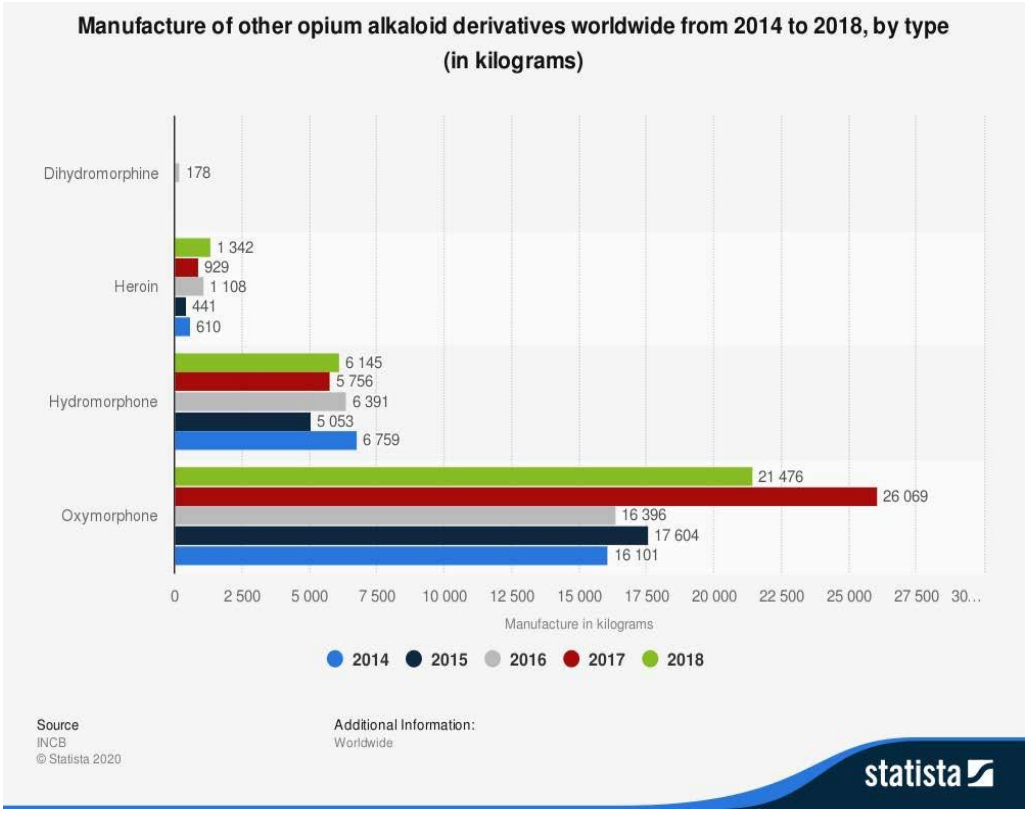
Export opium alkaloids in 2018



Extraction and manufacture of opium alkaloids and others between2014-2018 by type worldwide



Source: Statista from INCB



Source: Statista from INCB

Appendix

Comtrade UN database import-export opium sap and alkaloids in 2018 (exhaustive list of countries 6 pages)

comtrade-130211-293911-2018

Year	Trade Flow Code	Trade Flow	Reporter	Partner	Commodity Code	Commodity	Qty Unit Code	Qty	Netweight (kg)	Trade Value (US$)	Flag
2018	1	Import	Austria	World	130211	Vegetable saps and extracts; opium	8	190	190	16173	0
2018	1	Import	Belgium	World	130211	Vegetable saps and extracts; opium	8	408	408	26594	0
2018	2	Export	Belgium	World	130211	Vegetable saps and extracts; opium	8	512	512	21845	0
2018	1	Import	Bosnia Herzegovina	World	130211	Vegetable saps and extracts; opium	8	0	0	0	0
2018	1	Import	Brazil	World	130211	Vegetable saps and extracts; opium	8	105	105	41377	0
2018	2	Export	Brazil	World	130211	Vegetable saps and extracts; opium	8	12	12	20	0
2018	1	Import	Brunei Darussalam	World	130211	Vegetable saps and extracts; opium	8	11	11	137	6
2018	1	Import	Bulgaria	World	130211	Vegetable saps and extracts; opium	8	125	125	2186	0
2018	1	Import	Myanmar	World	130211	Vegetable saps and extracts; opium	8	13500	13500	94500	0
2018	1	Import	Canada	World	130211	Vegetable saps and extracts; opium	8	299	299	1589	0
2018	2	Export	Canada	World	130211	Vegetable saps and extracts; opium	8	10400	10400	30138	0
2018	1	Import	Denmark	World	130211	Vegetable saps and extracts; opium	8	90	90	5800	0
2018	1	Import	El Salvador	World	130211	Vegetable saps and extracts; opium	8	10	10	8304	0
2018	1	Import	Finland	World	130211	Vegetable saps and extracts; opium	8	4	4	1939	0
2018	1	Import	France	World	130211	Vegetable saps and extracts; opium	8	14683		1764536	6
2018	1	Import	Germany	World	130211	Vegetable saps and extracts; opium	8	1821	1821	218664	0
2018	2	Export	Germany	World	130211	Vegetable saps and extracts; opium	8	6	6	2268	0
2018	2	Export	Ghana	World	130211	Vegetable saps and extracts; opium	8	54	54	213	0
2018	1	Import	Greece	World	130211	Vegetable saps and extracts; opium	8	105	105	911	0
2018	2	Export	Hungary	World	130211	Vegetable saps and extracts; opium	8	0		3	6
2018	1	Import	Indonesia	World	130211	Vegetable saps and extracts; opium	8	101436	101436	340235	0
2018	1	Import	Ireland	World	130211	Vegetable saps and extracts; opium	8	130	130	1769	0
2018	2	Export	Italy	World	130211	Vegetable saps and extracts; opium	8	2880	2880	39095	0
2018	1	Import	Japan	World	130211	Vegetable saps and extracts; opium	8	30000	30000	2707769	0
2018	1	Import	Rep. of Korea	World	130211	Vegetable saps and extracts; opium	8	0	0	60	0
2018	1	Import	Latvia	World	130211	Vegetable saps and extracts; opium	8	54	54	63	0
2018	1	Import	Malaysia	World	130211	Vegetable saps and extracts; opium	8	8400	8400	139583	0
2018	2	Export	Malaysia	World	130211	Vegetable saps and extracts; opium	8	10	10	6636	0
2018	1	Import	Netherlands	World	130211	Vegetable saps and extracts; opium	8	29	29	1640	0
2018	1	Import	New Zealand	World	130211	Vegetable saps and extracts; opium	8	1000	1000	70136	0
2018	1	Import	Nicaragua	World	130211	Vegetable saps and extracts; opium	8	100	100	94	0
2018	1	Import	Peru	World	130211	Vegetable saps and extracts; opium	8	55	55	2288	0
2018	2	Export	Peru	World	130211	Vegetable saps and extracts; opium	8	2688	2688	165689	0
2018	1	Import	Poland	World	130211	Vegetable saps and extracts; opium	8	190	190	21358	0
2018	2	Export	Poland	World	130211	Vegetable saps and extracts; opium	8	40	40	1293	0

2018	1	Import	Portugal	World	130211	Vegetable saps and extracts; opium	8	650	650	30621	0
2018	1	Import	Romania	World	130211	Vegetable saps and extracts; opium	8	1	1	351	6
2018	2	Export	India	World	130211	Vegetable saps and extracts; opium	8	48738	48738	3351430	0
2018	1	Import	Singapore	World	130211	Vegetable saps and extracts; opium	8	4	4	119	0
2018	2	Export	Singapore	World	130211	Vegetable saps and extracts; opium	8	24	24	239	0
2018	1	Import	Viet Nam	World	130211	Vegetable saps and extracts; opium	8	20		2460	6
2018	1	Import	South Africa	World	130211	Vegetable saps and extracts; opium	8	54	54	1782	0
2018	2	Export	South Africa	World	130211	Vegetable saps and extracts; opium	8	20	20	100	0
2018	1	Import	Zimbabwe	World	130211	Vegetable saps and extracts; opium	8	0	0	274	0
2018	1	Import	Spain	World	130211	Vegetable saps and extracts; opium	8	350879	350879	615368	0
2018	2	Export	Spain	World	130211	Vegetable saps and extracts; opium	8	53861	53861	84731	0
2018	1	Import	Sudan	World	130211	Vegetable saps and extracts; opium	8	3	3	3	0
2018	2	Export	Eswatini	World	130211	Vegetable saps and extracts; opium	8	811	811	88450	0
2018	2	Export	Switzerland	World	130211	Vegetable saps and extracts; opium	8	208	208	31940	0
2018	2	Export	Thailand	World	130211	Vegetable saps and extracts; opium	8	10	10	1146	0
2018	2	Export	United Arab Emirates	World	130211	Vegetable saps and extracts; opium	8	900	900	2352	0
2018	3	Re-Export	United Arab Emirates	World	130211	Vegetable saps and extracts; opium	8	900	900	2352	0
2018	2	Export	Turkey	World	130211	Vegetable saps and extracts; opium	8	129	129	18149	0
2018	2	Export	United Kingdom	World	130211	Vegetable saps and extracts; opium	8	963	963	34097	0
2018	1	Import	USA	World	130211	Vegetable saps and extracts; opium	8	50	50	8731	0
2018	2	Export	USA	World	130211	Vegetable saps and extracts; opium	8	54187	54187	1961649	0
2018	3	Re-Export	USA	World	130211	Vegetable saps and extracts; opium	8	101	101	3367	0
2018	1	Import	Argentina	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	643	643	496577	0
2018	1	Import	Australia	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	24802	24802	7672493	0
2018	2	Export	Australia	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	44561	44561	8269201	0
2018	1	Import	Austria	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	2969	2969	3147664	6
2018	2	Export	Austria	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	57	57	43747	0
2018	1	Import	Bahrain	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	2	2	8139	0
2018	1	Import	Belgium	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	14154	14154	856163	6
2018	2	Export	Belgium	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	31495	31495	14818648	0
2018	1	Import	Bermuda	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	7	7	506	0
2018	1	Import	Bolivia (Plurinational State of)	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	173	173	135973	0
2018	1	Import	Bosnia Herzegovina	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	1	1	6886	0
2018	1	Import	Brazil	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	13740		7258122	0
2018	2	Export	Brazil	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	0		10	6
2018	1	Import	Brunei Darussalam	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	1250	1250	945	0
2018	1	Import	Bulgaria	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	3508	3508	4571032	6
2018	1	Import	Belarus	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	305	305	278900	0

2018	1	Import	Cambodia	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	206		95851	6
2018	1	Import	Canada	World	293911	Alkaloids; of opium and their derivatives; salts thereof	1	0		14525660	0
2018	2	Export	Canada	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	3120	3120	84844	0
2018	1	Import	Chile	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	721	721	426125	6
2018	2	Export	Chile	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	5350	5350	223874	0
2018	1	Import	China	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	1717	1717	5370030	6
2018	2	Export	China	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	57		30836	6
2018	1	Import	Colombia	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	3561	3561	2935339	0
2018	1	Import	Costa Rica	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	308	308	145445	6
2018	1	Import	Croatia	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	0	0	21355	6
2018	2	Export	Croatia	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	1	1	4601	0
2018	1	Import	Cyprus	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	414	414	490300	0
2018	1	Import	Czechia	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	3147	3147	1482367	6
2018	2	Export	Czechia	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	1714	1714	44139494	6
2018	1	Import	Denmark	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	3989	3989	1832309	0
2018	2	Export	Denmark	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	2596	2596	2955696	0
2018	1	Import	Dominican Rep.	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	205		96783	6
2018	1	Import	Ecuador	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	1242	971	775993	0
2018	1	Import	El Salvador	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	561	561	265544	0
2018	2	Export	El Salvador	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	0	0	1	0
2018	1	Import	Estonia	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	1	1	324	0
2018	1	Import	Finland	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	693	693	387437	6
2018	1	Import	France	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	71347		33176819	6
2018	4	Re-Import	France	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	1		886	6
2018	1	Import	Germany	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	31338	31338	25097933	6
2018	1	Import	Ghana	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	14	14	18225	0
2018	1	Import	Greece	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	9915	9915	3274294	0
2018	1	Import	Guatemala	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	149	149	119355	0
2018	1	Import	Honduras	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	6	6	7312	0
2018	1	Import	China, Hong Kong SAR	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	5472	5472	2841116	0
2018	2	Export	China, Hong Kong SAR	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	384	384	277429	0
2018	1	Import	Hungary	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	21962	21962	10470108	6
2018	2	Export	Hungary	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	11909	11909	4744327	6
2018	1	Import	Iceland	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	1	1	204	0
2018	1	Import	Indonesia	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	3144	3144	1456810	0
2018	1	Import	Iran	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	1300	1300	93790	0
2018	2	Export	Iran	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	13430	13430	2968871	0
2018	1	Import	Ireland	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	4905	4905	2580941	0

2018	2	Export	Ireland	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	13	13	6593	0
2018	1	Import	Israel	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	2681		1247000	6
2018	1	Import	Italy	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	10721	10721	6385589	0
2018	2	Export	Italy	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	16568	16568	7194649	0
2018	1	Import	Côte d'Ivoire	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	50	50	33044	0
2018	1	Import	Japan	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	14934	14934	6052488	6
2018	1	Import	Kazakhstan	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	4		19699	6
2018	1	Import	Jordan	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	100	100	54338	0
2018	1	Import	Rep. of Korea	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	7789		5458241	6
2018	1	Import	Kyrgyzstan	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	0		8	6
2018	1	Import	Lebanon	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	100	100	56450	0
2018	1	Import	Latvia	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	34		15945	6
2018	1	Import	Lithuania	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	5	5	6704	0
2018	1	Import	Malaysia	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	251	251	229902	0
2018	1	Import	Malta	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	36	36	127379	6
2018	1	Import	Other Asia, nes	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	16609	16609	1090282	6
2018	1	Import	Mongolia	World	293911	Alkaloids; of opium and their derivatives; salts thereof	1	0		370	6
2018	1	Import	Montenegro	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	0	0	821	0
2018	1	Import	Morocco	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	3060	3060	1657194	0
2018	1	Import	Oman	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	6760	6760	1832891	0
2018	1	Import	Namibia	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	0		218	6
2018	1	Import	Netherlands	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	12928	12928	1760593	6
2018	2	Export	Netherlands	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	3593	3593	898210	6
2018	1	Import	New Zealand	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	3082		1433533	6
2018	2	Export	New Zealand	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	17		9707	6
2018	1	Import	Nicaragua	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	10	10	14460	0
2018	1	Import	Niger	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	5	5	254	0
2018	1	Import	Norway	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	18141	18141	6427355	0
2018	2	Export	Norway	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	24145	24145	8969376	0
2018	1	Import	Palau	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	0	0	94	0
2018	1	Import	Pakistan	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	1029	1029	606330	0
2018	1	Import	Paraguay	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	354	354	214114	6
2018	2	Export	Paraguay	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	0		2	6
2018	1	Import	Peru	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	193	193	194630	6
2018	1	Import	Poland	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	2439	2439	1524739	6
2018	2	Export	Poland	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	1455	1455	828285	6
2018	1	Import	Portugal	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	8292	8292	2232034	6
2018	1	Import	Romania	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	1027	1027	539553	6

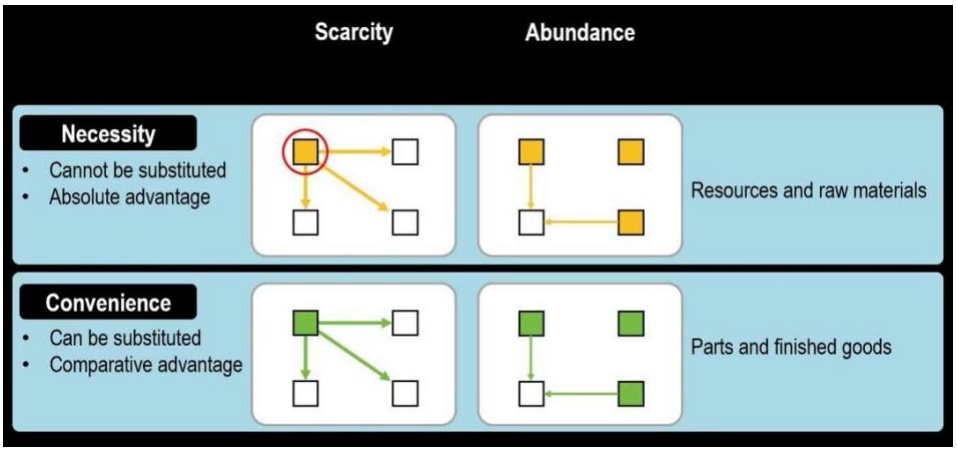
Appendix

2018	1	Import	Russian Federation	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	426		417210	6
2018	2	Export	Russian Federation	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	11	11	1457	0
2018	1	Import	Serbia	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	115	115	190399	6
2018	1	Import	Seychelles	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	2	2	1319	0
2018	1	Import	India	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	37653	37653	15752253	6
2018	2	Export	India	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	4	4	36751	6
2018	1	Import	Singapore	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	704	704	296881	6
2018	2	Export	Singapore	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	129	129	88913	0
2018	1	Import	Slovakia	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	118	118	78155	6
2018	2	Export	Slovakia	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	17669	17669	6083443	6
2018	1	Import	Viet Nam	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	9519		4426284	6
2018	1	Import	Slovenia	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	18	18	8381	0
2018	1	Import	South Africa	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	11268	11268	3924811	0
2018	2	Export	South Africa	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	254	254	26919	0
2018	1	Import	Zimbabwe	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	1617	1617	293547	0
2018	1	Import	Spain	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	3505	3505	1089168	0
2018	2	Export	Spain	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	139272	139272	49552305	0
2018	1	Import	Sweden	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	4014		1866698	6
2018	1	Import	Switzerland	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	12886	12886	15001670	6
2018	2	Export	Switzerland	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	15612	15612	20969373	6
2018	1	Import	Thailand	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	852	852	382631	6
2018	2	Export	Thailand	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	0		1	6
2018	1	Import	Tunisia	World	293911	Alkaloids; of opium and their derivatives; salts thereof	1	0		919618	6
2018	1	Import	Turkey	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	16	16	8590	0
2018	2	Export	Turkey	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	27049	27049	9297107	0
2018	1	Import	Uganda	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	40	40	36629	0
2018	1	Import	North Macedonia	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	446	467	237789	6
2018	2	Export	North Macedonia	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	3	3	912	6
2018	1	Import	United Kingdom	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	100313	100313	71791514	6
2018	2	Export	United Kingdom	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	82226	82226	136494701	6
2018	4	Re-Import	United Kingdom	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	1	1	1440	0
2018	1	Import	USA	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	100777	100777	171884591	0
2018	2	Export	USA	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	14699	14699	24540154	0
2018	3	Re-Export	USA	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	703	703	3254620	0
2018	1	Import	Uruguay	World	293911	Alkaloids; of opium and their derivatives; salts thereof	8	113	113	72584	0
2018	1	Import	Bahamas	World	130211	Vegetable saps and extracts; opium	8	2737	2737	9553	0
2018	1	Import	Nigeria	World	130211	Vegetable saps and extracts; opium	8	15902	15902	31877	0
2018	1	Import	Philippines	World	130211	Vegetable saps and extracts; opium	8	12212	12212	62724	0

2018	1	Import	Senegal	World	130211	Vegetable saps and extracts; opium	8	110	110	46740	0
2018	2	Export	Senegal	World	130211	Vegetable saps and extracts; opium	8	143	143	49565	0
2018	1	Import	Egypt	World	130211	Vegetable saps and extracts; opium	8	250	250	16451	0
2018	1	Import	Georgia	World	293911	Alkaloids, vegetable; of opium and their derivatives; salts thereof	8	0	0	2501	0
2018	1	Import	Gambia	World	293911	Alkaloids, vegetable; of opium and their derivatives; salts thereof	8	14	109	16133	0
2018	1	Import	State of Palestine	World	293911	Alkaloids, vegetable; of opium and their derivatives; salts thereof	8	7		3261	6
2018	1	Import	Kenya	World	293911	Alkaloids, vegetable; of opium and their derivatives; salts thereof	8	52	52	36615	0
2018	2	Export	Kenya	World	293911	Alkaloids, vegetable; of opium and their derivatives; salts thereof	8	20	20	367	0
2018	1	Import	Mexico	World	293911	Alkaloids, vegetable; of opium and their derivatives; salts thereof	1	0		1784813	0
2018	1	Import	Rep. of Moldova	World	293911	Alkaloids, vegetable; of opium and their derivatives; salts thereof	8	12	12	5976	6
2018	1	Import	Nigeria	World	293911	Alkaloids, vegetable; of opium and their derivatives; salts thereof	8	3437	3437	944470	0
2018	1	Import	Philippines	World	293911	Alkaloids, vegetable; of opium and their derivatives; salts thereof	8	21	21	24278	0
2018	1	Import	Saudi Arabia	World	293911	Alkaloids, vegetable; of opium and their derivatives; salts thereof	8	801	801	333404	0
2018	1	Import	Senegal	World	293911	Alkaloids, vegetable; of opium and their derivatives; salts thereof	8	866	866	488803	0
2018	2	Export	Senegal	World	293911	Alkaloids, vegetable; of opium and their derivatives; salts thereof	8	238	238	121202	0
2018	1	Import	Ukraine	World	293911	Alkaloids, vegetable; of opium and their derivatives; salts thereof	8	2837		3545214	6
2018	1	Import	Egypt	World	293911	Alkaloids, vegetable; of opium and their derivatives; salts thereof	8	400	400	395190	0
2018	1	Import	Guyana	World	293911	Concentrates of poppy straw; buprenorphine (INN), codeine, dihydrocodeine (INN), ethylmorphine, etorphine (INN), heroin, hydrocodone (INN), hydromorphone (INN), morphine, nicomorphine (INN), oxycodone (INN), oxymorphone (INN), pholcodine (INN), thebacon (INN) & thebaine; salts thereof	8	30	30	17618	0
2018	2	Export	Guyana	World	293911	Concentrates of poppy straw; buprenorphine (INN), codeine, dihydrocodeine (INN), ethylmorphine, etorphine (INN), heroin, hydrocodone (INN), hydromorphone (INN), morphine, nicomorphine (INN), oxycodone (INN), oxymorphone (INN), pholcodine (INN), thebacon (INN) & thebaine; salts thereof	8	1635	1635	33247	0
2018	1	Import	Barbados	World	293911	Concentrates of poppy straw; buprenorphine (INN), codeine, dihydrocodeine (INN), ethylmorphine, etorphine (INN), heroin, hydrocodone (INN),	8	88	88	58800	0

Source: https://comtrade.un.org/ (data cleaned and highlighted by me)

Appendix 17. Scarcity vs Abundance



Source : https://transportgeography.org/

Appendix 18. Opioid Strategy

Source: https://www.unodc.org/unodc/en/opioid-crisis/the-strategy.html

Appendix 19. Non-exhaustive list of expert research side-lined

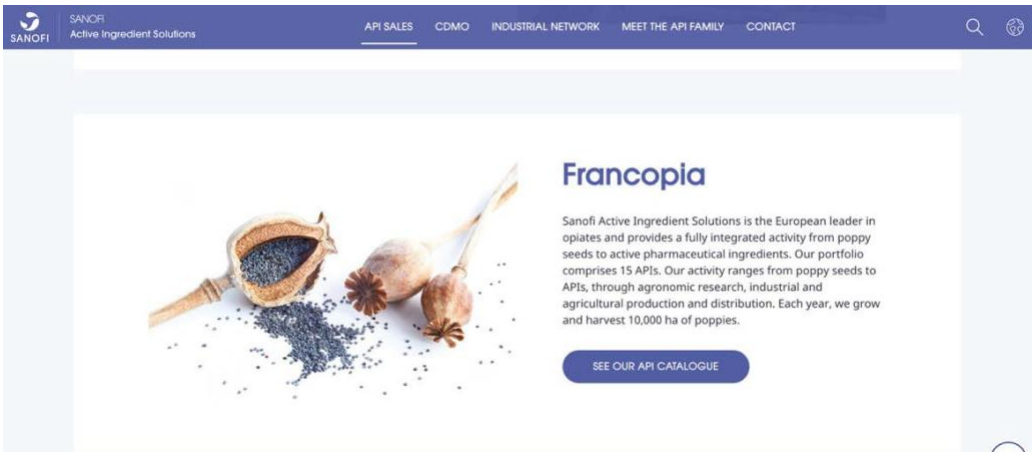
TABLE 9.1 Expert drug reports

Report*	Country	Date
Indian Hemp Drugs Commission Report	UK	1894
Departmental Committee on Morphine and Heroin Addiction, Report (Rolleston Report)	UK	1926
Panama Canal Zone Military Investigation	USA	1929
LaGuardia Committee Report	USA	1944
Interdepartmental Committee, Drug Addiction (First Brain Report)	UK	1961
Drug Addiction: Crime or Disease? Joint Committee of the American Bar Association and the American Medical Association on Narcotic Drugs, Interim and Final Reports	USA	1961
Interdepartmental Committee, Drug Addiction, Second Report (Second Brain Report)	UK	1965
Advisory Committee on Drug Dependence, Cannabis (Wootton Report)	UK	1968
Canadian Government Commission of Inquiry into the Non-Medical Use of Drugs (Le Dain Report)	Canada	1970
Dealing with Drug Abuse: A Report to the Ford Foundation by the Drug Abuse Survey Project	USA	1972
Marihuana: A Signal of Misunderstanding. National Commission on Marihuana and Drug Abuse	USA	1972
Drug Use in America: A Problem in Perspective, National Commission on Marihuana and Drug Abuse	USA	1973
The Nation's Toughest Drug Law: Evaluating the New York Experience, by the Joint Committee on New York Drug Law Evaluation, of the Association of the Bar of the City of New York	USA	1977
An Analysis of Marihuana Policy. National Research Council of the National Academy of Science	USA	1982
A Wiser Course: Ending Drug Prohibition. A Report of the Special Committee on Drugs and the Law of the Association of the Bar of the City of New York	USA	1994
Legislative Options for Cannabis	Australia	1994

* All these reports can be read online: <www.druglibrary.org/schaffer/Library/studies/studies.htm>.

Source: Julia Buxton. (2006). The political economy of narcotics: Production, consumption and global markets. New York: Zed Books, p.121.

Appendix 20. Screenshot of Sanofi's website



Source: webpage of Global Sanofi accessed December 9th, 2020.

Appendix 21. Table of human use of opium compared to other opioids

Table 1
Human Uses for Opium Compared to Other Opioid Drugs.

Opium	Historical human medical uses[a]	Other opioids	Uses in humans presently[b]
		Morphine	Severe pain
	Diarrhea	Codeine	Mild to moderate pain, and for cough in conjunction with other medications
	Cough	Papaverine	To improve circulation of blood flow
	Cold	Heroin	Pain, myocardial infarction[d]
	Infant colic	Methadone	Long-term pain management and MAT therapies[c]
	Infant crying	Oxocodone	Moderate to severe pain
	Fatigue	Hydrocodone	Long-term treatment of severe pain
	Depression	Buprenorphine	MAT therapies
	Anxiety	Naloxone	To reverse respiratory depression caused by opioid overdose
	Insomnia	Tramadol	Moderate to moderately severe pain
	Muscle pain	Meperidine	Moderate to severe pain
	Rheumatism	Fentanyl	Severe pain, especially advanced cancer pain
	Sore/dry eye		
	Cholera		
	Dysentery		
	Earache		
	Toothache		
	Stomach cramps		
	Flatulence		
	Headaches		
	Insanity		
	Hysteria		
	Menopause		
	Hemorrhoids		
	Ulcers		
	Bruises		
	Sprains		
	Chilblains		

[a] This list could not possibly be comprehensive, given that opium has been widely used by most human communities over the course of the last several thousand years. From (Berridge and Edwards 1980; Merlin 1984).
[b] From MedlinePlus database, US National Library of Medicine, and the National Institutes of Health. These lists exclude use for pleasure or uses for self-medication. All of these drugs, with the exception of papaverine, are often used for pleasure or self-medication according to anecdotal evidence, though systematic data collection is nonexistent.
[c] MAT means medically assisted treatment and is the common term to describe the process by which less harmful opioids are substituted for more harmful ones in order to help users manage the withdrawal symptoms associated with recovery from opioid addiction.
[d] These uses are not permitted in the US but are in other countries.

Source: Breger Bush, S. (2020). Opioid Ontopolitics: Industrial Capitalism, Metabolic Rift, and the Power of Things. *International Journal of Drug Policy, 82*, p.7.