

An Analysis of the Potential for Repurposing Human Smuggling Routes and Tactics by Bioterrorists

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PUBP 765

1. Introduction

Human smuggling involves circumventing immigration controls in order to move people covertly from points of origin that are often remote, inhospitable, and lawless into more prosperous and stable nations that are otherwise legally-inaccessible to the migrants[1]. A subset of transnational terrorists shares similar geographic points of origin and a similar objective of gaining surreptitious access to a prosperous, Western nation[2]. While the ultimate motives of these two groups differ, the overlap in operational logistics raises the possibility that a terrorist could leverage the routes, techniques, and services refined over years by human traffickers to ultimately achieve the same type of undetected access to their target nation[3].

This concept is not novel, and the degree to which such overlap might occur has been the subject of considerable debate in national security circles[4]. Notwithstanding, many of these debates either focus on broad hypotheticals or take for granted that an aspiring terrorist has already reached a U.S. border[4-6]. Relatively less attention is paid to the end-to-end, logistic details of the process by which a prospective terrorist might repurpose existing human smuggling operations to gain entry into the United States[7]. This type of analysis may provide valuable insight into the specific characteristics of terrorists that might avail themselves of this methodology, the unique types of terrorist plots that could include this type of covert movement of people, and the potential opportunities for detecting and disrupting these types of operations.

A complete discussion of this topic, encompassing all every form of terrorism across all potential target nations, is beyond the scope of this paper. Instead, this analysis will focus specifically on the scenario of foreign actors intending to perpetrate acts of bioterrorism on mainland U.S. soil. The first half of the analysis will examine the context in which a bioterrorist might consider leveraging human smuggling routes and services to secure covert entry into the United States, including some of the unique requirements of bioterror plots that could make this strategy an attractive methodology for motivated bioterrorists. The second half will examine specific human trafficking routes and practices that might be utilized to these ends. The ultimate objective is to provide a comprehensive analysis of the conditions and operational logistics through which a bioterrorist might leverage this type of convergence.

2. Context

2.1. Overview

Before analyzing the details of specific human smuggling routes and methods that may be utilized by transnational bioterrorists, it is necessary to understand both the general context in which bioterrorism plots might arise and some of the unique, operational requirements of such plans. As no acts of transnational bioterrorism have yet been committed on U.S. soil, this discussion is necessarily speculative. Nonetheless, the operational requirements of bioterrorism establish the parameters within which human smuggling methodologies could be leveraged, and so this discussion will frame the subsequent analysis.

2.2. Bioterrorists and Motivations

“A bioterrorist can include any non-state actor who uses or threatens to use biological agents on behalf of a political, religious, ecological, or other ideological cause without reference to its moral or political justice[8].” The motives behind bioterrorism plots may be similar to those underlying more traditional acts of terrorism; namely, “to intimidate or coerce a government or civilian population in furtherance of political or social objectives[9].” However, bioterrorism is not necessarily constrained by political or social motives. Carus notes that bioterrorists may also be motivated by apocalyptic desires to induce casualties on a massive scale, or by a desire to fulfill, “specialized objectives not necessarily intended to directly influence government actions[8].” Similarly, the targets of bioterrorists can be domestic or international. The specific motive, nationality, or ideology of the bioterrorist is not relevant to this discussion. The only constraint placed to these ends will be that the terrorist originates outside of the United States and seeks to enter the U.S. covertly in order to execute an act of bioterrorism on U.S. soil.

For the purpose of this discussion, specific characteristics of the individual bioterrorist(s) who are smuggled will be unconstrained. The term, “bioterrorist,” is used as an umbrella term that could include any of a variety of types of individuals involved in a bioterror plot. For example, the individual could be:

- a relatively low-level operative who is employed primarily to smuggle a biological agent into the U.S. covertly on their person, where they will then rendezvous with associates who will carry out an attack using the smuggled agent.

- a lone actor or member of a small cell who is planning on transporting the agent and then personally executing the attack.
- a necessary participant in a bioterror plot who is not, themselves, transporting the agent yet must enter the U.S. covertly due to inability to access the country via any other means. This could be the case if, for instance, the individual was already biometrically recorded on a terror watch list.
- a more highly-skilled expert with a scientific background who is planning on acquiring an agent *en route* to the U.S.

This list is not exhaustive, and, regardless of the individual's specific role in a bioterror plot, the discussion of their repurposing of human smuggling routes and methods is broadly applicable.

2.3. Legal Entry into the United States

The simplest and most attractive route of entry into the United States for any terrorist is via a commercial flight(s) from their point of origin, followed by legal entry to the U.S. at an airport border control point. Terrorists who are natural born or naturalized U.S. citizens, lawful permanent residents, or holders of valid U.S. visas can enter unincumbered in this fashion. Those on visas who have entered the U.S. for illicit purposes will often overstay their visas[7]. At this point they become difficult to trace. The majority of terrorists who have committed acts of terror on U.S. soil have entered the country legally and have comprised all of these categories[10]. For example, all 19 of the hijackers involved in the 9/11 terrorist attacks on the United States entered the country legally using valid, U.S. visas in conjunction with valid passports (most from Saudi Arabia) [11, 12].

An alternative form of legal entry into the U.S for illicit purposes involves an irregular migrant or potential terrorist presenting themselves at a U.S. border control point and requesting asylum. This typically results in the declared asylum seeker being taken onto U.S. territory and held while background checks are performed. If the entrant has no obvious criminal or terrorist history, they are often released into the U.S. pending a formal asylum hearing. At this point, those with nefarious intent can “disappear” into the U.S. and are free to pursue their actual objectives. Often, they do not report for their asylum hearings. Similar to those who overstay visas, these irregular migrants subsequently become difficult to locate. This strategy is

a form of “asylum abuse” and is a common tactic among both irregular migrants and potential terrorists[7].

Legal entry, with or without visa overstay or asylum abuse, would be the most logical mechanism of entry for a terrorist seeking to attack U.S. soil. An illicit mechanism of entry would only need to be pursued under specific circumstances. The following section (§2.4) will discuss conditions that may lead a terrorist to seek illegal entry into the United States via human smuggling routes.

2.4. Scenarios for Terrorists Seeking Illegal Entry into the United States

2.4.1. *Bioterrorist transporting a biological agent.* The first scenario that may lead a bioterrorist to seek illegal entry into the United States would be that of a terrorist who is actively transporting a biological agent and intends to cross into the U.S. with the agent in his possession. In this situation, even a bioterrorist who could obtain legal entry into the U.S. may choose to pursue cross-border human smuggling because of a legitimate concern that the agent they are transporting would be detected by airport security (U.S. Customs and Border Control, etc.). It is important to note that, as described later (§4), most human smuggling routes into the United States still involve trans-oceanic air transport at some phase. This would be an important challenge for a bioterrorist transporting a biological agent to address, as a biological agent could theoretically be detected by airport security and immigration control at any nation’s airport. To mitigate the risks associated with entry by air, the bioterrorist could select as their trans-oceanic flight destination an airport where they believed that security was lax enough that the agent smuggled on their person or with their personal effects would go undetected. However, the only way to eliminate entirely the risk of agent detection at a point of entry would be for the bioterrorist to enter illicitly by land or sea.

An intermediate strategy would be to fly via a trans-oceanic route to a country outside of the U.S., then acquire their agent *en route* to an illicit, land-based crossing onto U.S. soil. This could be accomplished in one of (at least) three ways. First, the biological weapon could be smuggled into an intermediary country along the terrorist’s intended transit path via a less risky method (shipping container, etc.), and the terrorist could collect the smuggled material at its port of entry while traveling to the U.S. Second, the biological weapon could be handed off to the traveling terrorist by a conspirator placed along the

terrorist's transit route who has previously acquired the biological agent. Third, the bioterrorist could pause during their travels to acquire an agent *de novo* from a natural, environmental reservoir. This is theoretically possible, for instance, in South America, where a number of hemorrhagic fever viruses exist in nature that could be collected by a knowledgeable actor and used in a subsequent terrorist attack.

All of these scenarios introduce complexity into an already-difficult process of human smuggling over long distances. The most plausible scenario may be the first, where a biological agent is smuggled through an international airport that is less secure than a typical, U.S. airport. Corruption is common in many countries that serve as trans-oceanic intermediary destinations along transnational human smuggling routes, and this could be leveraged to the advantage of the bioterrorist. The other scenarios (separate agent smuggling, acquisition *en route*, or completely covert movement without any air travel) are also possible, although the logistic complexities introduced by any of the three would further complicate the human smuggling process.

2.4.2. Terrorist who cannot secure legal entry into the United States. It is possible that an aspiring terrorist may not be able to gain legal entry into the United States. This is true for both traditional terrorists and bioterrorists. This situation could arise, for instance, if the terrorist was already on a terror watch list or logged in a national law enforcement database. Biometric identification has become standard for international travelers entering the United States[13], and a potential bioterrorist whose fingerprints or face would trigger a criminal database alert at a border check would not have legal entry as a valid option. This would be true even if the terrorist was able to acquire illicit travel documents and to travel under a false identity. If such a person was intent on committing an act of terrorism against the U.S., their only option for entry may be to cross the U.S. border illegally. Of course, this type of person would not be an ideal selection as an operative for a terrorist organization targeting the U.S., but it is possible that such a person could be highly, personally motivated to commit such an act. In that case, illegal entry into the U.S. would be their only option.

2.4.3. Synthesis. This discussion demonstrates that the pool of potential terrorists who might seek to leverage human smuggling routes and techniques to gain entry into the United States is small, and the scenarios that may prompt a terrorist to pursue this strategy for illegal entry

are highly specific. Indeed, most terrorists intent on attacking the United States have entered the country legally[10], and future terrorists will presumably pursue similar strategies. Notwithstanding, illegal entry attempts into the U.S. by known and suspected terrorists have been documented[14, 15], indicating that this strategy remains a potentially viable option for selected members of these groups.

While legal mechanisms of entry into the U.S. may be preferable for most potential terrorists, bioterrorism may represent a unique exception to this rule. A bioterrorist requires a biological weapon to execute their intended act, and this weapon must either be transported with the terrorist, smuggled separately into the United States and then acquired by the bioterrorist, or synthesized *de novo* by a terrorist organization operating on U.S. soil. Any of these three scenarios are possible, but an organization contemplating a U.S. bioterror attack may well decide that carrying a biological agent across the U.S. border is more likely to be successful than attempting to smuggle an agent through a U.S. entry port or to synthesize an agent while on U.S. soil. This decision may be reasonable, as considerable effort and expenditures are made annually by the U.S. Government on detection and interdiction of biological threats at ports of entry[16]. However, airtight monitoring is impossible to achieve across the entirety of the United States' land borders. Similarly, domestic monitoring of the types of dual-use technologies and activities necessary to synthesize a biological weapon within the U.S. are considerable[17, 18]. Accordingly, though difficult, concomitant human smuggling and biological weapon smuggling may be an attractive option to a bioterrorist.

2.5. Bioweapons Agents and Their Impact on Transit Routes

2.5.1. Nature of the Biological Agent. Any of a variety of biological agents could be transported by a smuggled individual. These could include liquid, powdered, or frozen preparations of viruses, bacteria, or toxins in modest physical quantities. This discussion will assume only one condition – that the agent is packaged and stored such that it could be transported by a single individual, on their person, for the duration of the journey. Examples could vary in size and complexity, from as small as a few vials or bottles of a thermostable agent, to as complex and large as multiple cryovials of cold-preserved agent contained in a sealed dewar of liquid nitrogen (see §2.5.3). The former could be transported in a small waist pack, while the latter would require a moderately-sized backpack or duffel. This discussion is not

applicable to smuggling attempts that involve larger quantities or more complex transport apparatuses.

2.5.2. Geography of Agent Acquisition. The practical aspects of terrorist acquisition of a bioterrorism agent could influence the methods and route of transit to the U.S. selected by such terrorists. This is particularly true if the terrorist was physically transporting the agent during their movement to the U.S. In general, biological agents that could be used as weapons in terrorist attacks can be acquired by terrorists through one of three strategies. The first is for a terrorist to acquire an agent that has already been weaponized by a state biological weapons program through theft or diversion. Historically, security experts have considered the former Soviet republics to be a potential source for bioterrorism agents acquired through this mechanism[19]. Several countries in the Middle East are also suspected to have developed biological weapons[20], and are also potential risks for this type of diversion. A biological agent acquired through this mechanism would, therefore, need to be trafficked from a point of origin in Asia or the Middle East. Second, a naturally-occurring disease that meets appropriate criteria for use as a bioweapon could be collected from nature or from infected patients during an outbreak. This strategy may be most applicable to viruses that cause epidemic hemorrhagic fevers or encephalitides[21], which tend to be distributed throughout Africa, South Asia, and South America[22]. Trafficking from points of acquisition in these regions would, therefore, be necessary. Finally, biological agents could be engineered or produced *in situ*[23, 24] on U.S. soil by terrorist agents with specialized skill sets. This may not require trafficking of an agent from abroad, and so it is less relevant to this discussion.

This discussion suggests that Asia, Africa, and the Middle East represent the likely potential points of origin of bioterrorism agents acquired either naturally or through diversion. Accordingly, the subsequent analysis of the repurposing of human smuggling strategies by bioterrorists will focus particular attention on human smuggling routes originating in these regions.

2.5.3. Transportation Logistics. Could a bioterrorist actually transport a viable biological agent on their person across a human smuggling route into the United States? These routes tend to be time-consuming and often traverse inhospitable environments. If a potential

bioterrorism agent could not be transported with a bioterrorist passing along such a route, then further discussion would be moot. Although a full discussion of agent thermostability and transport conditions of all possible biological weapons agents is beyond the scope of this analysis, there is certainly evidence to suggest that various agents could likely survive such a trip while maintaining their infectivity. Some agents, including *Bacillus anthracis*, produce spores that are naturally thermostable and resistant to harsh environments for long periods of time[25]. Such agents would almost certainly survive this transit with little or no special transportation precautions. Freeze-drying methods (e.g. lyophilization, cryodesiccation) are common strategies for preserving cells and bacteria for long periods of time[26]. Freeze-dried bacteria are typically stored and transported at modest, low temperatures (4°C) and can remain viable for years under these conditions[26]. Moreover, current research regarding methods for long-term preservation and biobanking at room temperature is advancing rapidly, and multiple strategies have been reported for maintaining long-term stability of both bacteria and viruses at room temperature[27-29]. Even if mild cooling during transport (e.g., cooler / ice) could not be maintained, this growing field of emerging biotechnologies suggests that room-temperature transport will become progressively more commonplace. Finally, even for organisms that may require cryo-storage (e.g. viruses), transport devices currently exist that are relatively compact and lightweight, can be filled initially with liquid nitrogen, and can preserve temperatures below -130°C for transport periods of 45 days or more without requiring refilling (e.g. Worthington LD10 cryo-dewar, ~35lbs fully filled, ~12x24 inches, 45 day minimum static hold time[30]). This information suggests that current preservation and transport technologies are likely to preserve viability and infectivity in even the most challenging biological samples for at least 1-2 months in vessels that could be readily transported by a single individual. Future technological developments in emerging trends will likely further reduce the transport burden. For all of these reasons, biological agent smuggling along repurposed human smuggling routes could be a potentially technically-viable strategy.

2.6. Travel Logistics – special considerations for terrorists

2.6.1.Funding. Human smuggling requires that funds be paid to multiple traffickers and other criminal enterprises along the route to the United States. This is often a major challenge for smuggled migrants. These individuals tend to come from poor regions and have few

personal resources. This often necessitates interruptions in their transit as they work to raise funds for subsequent legs of their journeys. This, in turn, leads to transit times that can span many months or years[1, 31-35].

Potential terrorists using human smuggling routes, however, are likely to be much better funded. Terrorist organizations have multiple sources of income[36], and, presumably, an organization willing to take on the logistical challenges of smuggling a bioterrorist into the U.S. would have raised more than adequate funds to cover the smuggling fees. Having significant disposable funding could likely accelerate the smuggling process, as full-service, end-to-end “packages” are offered by smugglers to those with the ability to pay[37]. Notwithstanding, even those who pay sizeable fees are not immune from the inherent risks of human smuggling[38].

2.6.2.Fraudulent Documents. Obtaining fraudulent travel documents, including passports, visas, and identity documents, is a critical part of irregular migration. Illicit migrants from countries associated with high terrorism risks have been documented to utilize multiple forms of false or illegal documents, including, “altered stolen visa waiver European passports, forged visas, false identification cards, and fake banking and personal financial information required by visa offices[37].” Bioterrorists wishing to leverage human smuggling routes would need to acquire the requisite false documents needed for their illicit travels. This would most likely be coordinated through the same trafficking networks that facilitate their movements, as human smugglers are well-known to provide such services as part of their offerings. Similarly, terrorist networks have their own, longstanding histories of facilitating document fraud to facilitate terrorist movements. While these services can present cost-related challenges to typical, irregular migrants, the connections and the funds available to terrorist networks should render such acquisition straightforward[1, 37, 39].

While acquiring fraudulent documents may be relatively straightforward for a potential bioterrorist, route planning must include consideration of transit countries where such documents are likely to go undetected and achieve their objective of facilitating entry and transit for the terrorist. For this reason, direct travel into the United States, travel via Canada, and travel via European hubs may be less desirable than transit routes that rely on less secure ports. Specific data regarding attempted use of fraudulent documents at U.S. and European ports of entry are generally not publicly available, but in-depth knowledge of

mechanisms of document fraud[40] and considerable investments in passport security[41] and biometrics[42] by both the U.S. and the EU have presumably made their ports of entry among the most high-tech and most resilient to fraudulent documents. Accordingly, both irregular migrants and smuggled bioterrorists would likely attempt to avoid U.S., Canadian, and EU border security screening and would opt for routes that exploit countries with less border security, less training on fraudulent document detection, less identity verification technology, and more corruption in border security agencies[37]. This is another reason why the subsequent analysis of terrorist smuggling strategies will avoid routes that would involve security screening in either the U.S., Canada, or EU countries.

2.6.3. Connections. While both human smugglers and terrorists are transnational criminals, it is difficult to know the extent to which they interact[43]. For this reason, a terrorist organization considering leveraging a human smuggling route would need to have a reliable mechanism for making contact with a “reputable” human smuggling network and securing their services. This may not be a trivial challenge for a terrorist network, but ultimately it is reasonable to believe that a motivated transnational criminal organization would find a mechanism for connecting with reliable human smugglers in furtherance of their goals.

2.7. Section Summary

This section has examined the specific context in which a bioterrorist may elect to leverage human smuggling routes for the purpose of gaining covert entry into the United States. Legal options for entry have been presented and contrasted with the specific nature and circumstances associated with bioterrorists and bioterrorist plots that may necessitate selection of more covert, illicit entry strategies. The potential need for a bioterrorist to smuggle a biological weapon on their person during this process has been discussed, and the geographic regions in which agent acquisition may take place has established the potential starting points for the human smuggling process. The viability of the agent under conditions common to smuggling has also been considered in order to demonstrate that this transit strategy is viable, even with a biological agent in tow. Finally, the prerequisites of funding, document fraud, and connections across transnational criminal networks have been discussed as necessary conditions for efficient execution of the terrorist smuggling plot. Having demonstrated that the strategy of leveraging human smuggling routes and methods is viable and potentially valuable for a

bioterrorist seeking to perpetrate an attack on U.S. soil, the second section of this discussion will address the specific human smuggling routes and techniques that may be leveraged to these ends.

3. Human Trafficking Routes and Techniques for Bioterrorists

3.1. Points of Origin

The previous discussion has suggested that South Asia, Africa, and the Middle East are the most probable points of origin for suspected bioterrorists based on geographic availability of biological agents that may be used in acts of bioterrorism. Simultaneously, these regions are home to a majority of the transnational terrorist organizations that may be interested in conducting attacks on U.S. soil. To these ends, the United States has identified 35 “countries of interest” from which migrants and asylum seekers would be designated as “Special Interest Aliens” (SIAs)[37] based on the regional prevalence of terrorism. Figure 1 depicts the geography of naturally-occurring viral hemorrhagic fevers (Figure 1A) and the 2004 U.S.-designated “countries of interest” (Figure 1B). While these maps are neither exhaustive for all potential bioweapons agents nor for all potential terrorist organization locations, the figure is a useful illustration of the overlap between these regions. Accordingly, this analysis of points of origin will focus on South Asia, Africa, and the Middle East.

3.2. Human Smuggling Through South Asia and the Middle East

3.2.1. *South Asia*. Human smuggling routes in South Asia typically follow one of three directions. Irregular migrants may be moved eastward toward Southeast Asia, Australia, and the U.S.; northwest into Europe, or westward into the Middle East (Figure 2)[44]. The first two of these would ultimately involve security screening at U.S. or European points of entry, and so smuggled bioterrorists would be wise to avoid these routes (see §2.6.2). Accordingly, the most likely initial route for a bioterrorist originating from South Asia would be to an intermediate destination in the Middle East.

Human smuggling routes from Southwest Asia typically involve movement from Afghanistan to Pakistan by land across the mountainous Afghan-Pakistan border, and migrants can cross without documents or the assistance of smugglers. One common route is from Kabul to Peshawar to Quetta, and a second involves travel from Kandahar to Quetta, via Chaman. Once in Pakistan, smuggled persons destined for the Middle East may fly from

Quetta to Abu Dhabi or Dubai, if adequate false documentation is available. If not, they may travel southward by land towards Karachi and the coast of the Arabian Sea, then onward by boat to Oman. Alternately, they may be smuggled across the Pakistan-Iran border in uncontrolled desert areas near Chabahar, then cross the Gulf of Oman by boat from here. In either case, they are then smuggled by land into Dubai, Abu Dhabi, or Saudi Arabia[44-46] (Figure 3A).

A more northern route proceeds directly from Afghanistan to Iran. Smuggling from the region surrounding Herat may proceed across the Afghanistan-Iraq border near Kohsan, then through Northern Iran to Tehran. Alternately, the route may go southward toward Zaranj, where smuggling across the border into Iran leads to Kerman, or even further southward into Pakistan, and joins Pakistani smuggling routes into Iran[47] (Figure 3B). Further transit from these points will be discussed in the next section (§3.2.2).

Human smuggling routes in South Asia may also involve India, either as an origin or as a transit point from Southwest Asia. Smuggled persons originating in Bangladesh or Nepal may cross relatively porous land borders with India. Smugglers facilitate border crossings near small villages or small border control points and bribe border guards with ease. The regions surrounding Lahore and Bahawalnagar are popular points of illicit entry into India. Overland transit then proceeds to Mumbai or Karachi, which are hubs for westward smuggling[44] (Figure 2).

3.2.2.Middle East. The Middle East often serves as a transit point for human smuggling routes, although in the present context it could also serve as a point of origin for a bioterrorist. There are three groups of routes for human smuggling through the Middle East that are most relevant to the current discussion. First, smuggled persons who arrive in Saudi Arabia or the UAE (for instance, as described in §3.2.1) may use these cities as air transit hubs to Turkey, South Africa, or directly to the Western hemisphere. This typically requires high-quality, fraudulent identity documents, and outgoing travel is generally facilitated by human smugglers[44].

The second set of human smuggling routes in the Middle East involves transit of Iran. As described above (§3.2.1), individuals smuggled from Southern Asia often transit to Quetta. From Quetta, smugglers facilitate trafficking via two major routes. First, smuggled persons may cross the Pakistan-Iran border to the city of Chabahar. Here they may either

cross by sea into Oman or the UAE, or they may continue by land along the Southern coast of Iran to Bandar Abbas, to Shiraz, and then to Tehran. Second, human smuggling from Quetta may proceed along a more northern route, with border crossing into Iran near the city of Zahedan. The land route from here then leads to Mashhad and then to Tehran. Smuggled persons transiting a route from Northern Afghanistan (§3.2.1) may join these flows as the routes converge and move toward Tehran. Tehran serves as the major human smuggling hub in Iran[44]. This route is relevant to the current discussion in that smuggling often proceeds from Tehran to Turkey[44, 47, 48]. Turkey, in turn, can serve as a transit hub for the West [49].

The third group of smuggling routes are those used to get out of Iraq. This process is particularly dangerous and would likely only be relevant to a bioterrorist whose point of origin was inside Iraq. Currently there are three primary options for human smuggling from Iraq. First, those who live in the major air hubs of Baghdad, Basra, and Najaf are able to be smuggled directly by air into Turkey. Because it is difficult to enter these cities, non-residents of these areas cannot typically use these routes. Second, individuals originating in the Kurdistan region can be smuggled by land or air into Turkey. Air routes connect Erbil and Sulaymaniyah to Turkey but require valid Iraqi passports for travel. More common are land-based smuggling routes from Erbil to Zakho and into Turkey via the Ibrahim Khalil border crossing. Smuggling by car is often used for illicit border crossings at this transit point. Because entry into Kurdistan can also be difficult, this route is also only available to residents of the region. Finally, the riskiest route from Iraq to Turkey is to cross via Syria. This strategy is often used by locals of Anbar or Mosul. Smuggling via this route is a complex process that can involve one of several routes and several hand-offs between different human smugglers[44]. The UNODC describes the details as follows:

“For migrants using the Syrian Arab Republic route, the general steps of the smuggling journey are as follows: smuggled migrants either cross the border into Deir Ez-zor in the Syrian Arab Republic, or cross from Al Qaim in Iraq over the Al Bukamal border crossing into Al Mayadeen in the Syrian Arab Republic. Migrants change smugglers in Deir Ez-zor and Al Mayadeen. Sometimes the smuggled migrants wait in Deir Ez-zor or Al Mayadeen for several days while the smuggler gathers a larger group to commence the journey. The smuggler typically accommodates the migrants at his home or in a house that he uses for this

purpose. These two different routes then meet in Raqqa. From there, the smuggled migrants move to the Syrian/Turkish border to attempt their exit from the Syrian Arab Republic. Migrants typically change smugglers again in Raqqa and are accommodated by this new smuggler until they begin the journey to the border. From Raqqa, there are four main routes across the Syrian/Turkish border: through Manbij; through Al Bab; through Aleppo; or through the areas surrounding Kobane. From Aleppo, there is a smuggling route through Afrin or Khirbat Al Jawz[44].”

Also of note is human smuggling between Iraq, Syria, Lebanon, and Jordan. These routes are more dynamic, more dangerous, and less reliable, so less information is available. For locals who are well-informed regarding the immediate state of these routes, they may also present an option as transit routes through the Middle East[50].

3.2.3.*Synthesis*. In summary, the Middle East could serve as either a point of origin for bioterrorists or as a transit center for terrorists moving westward from South Asia. Smuggled persons will ultimately end up in either the UAE or Turkey, which they will use as a gateway for travel to Central or South America. For those who are able to secure high-quality false documents and who are not actively smuggling a biological weapon, this portion of the transit could be as simple as a few, brief flights.

The situation becomes considerably more complex if the bioterrorist has acquired a biological agent and is actively smuggling the weapon on their person. In this case, routes involving air travel would not be available. Land routes through South Asia and the Middle East are available, as described above, but these routes are considerably more complex, dangerous, and time consuming. Additionally, a route to the West that excludes air travel would necessarily involve transit from this region into North Africa, as air travel from Turkey or the UAE would not be options. A purely land-based route could pass through Iraq into Jordan and onward to Egypt, but this would transit across at least some part of Israel in order to reach Egypt and North Africa. This is likely to pose a challenge with regards to border security, including confronting the 152-mile Nitzana security fence along the Israel-Egypt border[51]. Alternately, Israel could be avoided through travel via Saudi Arabia, but this would also require a sea crossing of the Gulf of Aqaba. While smuggling has a long history in the Sinai Peninsula[52], the region is notoriously unstable, and the illicit economy is

subject to tribal control. The ongoing Sinai insurgency[53] has further destabilized the region and likely complicates human smuggling activities. It is difficult to comment further on human smuggling activities in this region, as the UNODC notes that,

“Specific study of the social profile of flows of migrants coming into North African countries from Asia or the Middle East...has not been conducted. Some reports by international organizations mention the existence of groups of smuggled migrants coming from Asia, especially from Bangladesh, India and Sri Lanka... Nevertheless, literature based on research in North African countries generally does not mention them, showing scarce interest in the issue[31].”

Clearly, human smuggling into North Africa from the Middle East without the use of air travel would be logistically difficult. This, in turn, has implications for the origin of a potential bioweapon intended for terrorist use. While a potential bioterrorist could originate in this region, it would likely prove difficult to smuggle an agent across the Middle East by land. This implies that a bioterrorist originating in South Africa or the Middle East and planning to smuggle a biological agent on their person would be better served by entering either Africa or South America by air and then acquiring their weapon *en route*. Human smuggling routes through these regions are the subject of the following sections.

3.3. Human Smuggling Routes Through Africa

3.3.1. *Overview.* Bioterrorists originating in Africa or transiting through the continent with the goal of reaching the United States would need to reach a port of debarkation for the Western hemisphere. Air travel would be the fastest and most logical mechanism. As discussed earlier (§2.3), we have already assumed that potential terrorists who could secure direct, legal entry into the U.S. and who were not smuggling a bioweapon would simply fly from their point of origin directly to the United States. Conversely, air travel would likely not be an option at all for any bioterrorist smuggling a biological agent, and sea-based transit would be required.

Air travel from Africa to the Western Hemisphere would, therefore, specifically be applicable to bioterrorists who could not secure legal entry into the U.S. and also did not intend to acquire a biological agent until they reached the Western hemisphere. While such terrorist agents may not be able to secure legal entry into the U.S., it is possible that they could secure legal entry into a South American country and then transit illicitly northward

into the U.S. If so, this would be the path of least resistance. However, if they could not secure legal entry into even a South American country, they would be forced to secure false documents to facilitate illicit entry. It is likely easier to enter South American countries on false documents than to enter the U.S., which is why this strategy may be appealing to a potential bioterrorist who meets the above criteria. In this circumstance, a single, direct flight from Africa to South America would be preferable to a flight that transits through an intermediate destination (typically in Europe), as only one border security checkpoint would need to be cleared. There are currently only two direct flight routes from Africa to South America: Luanda, Angola to São Paulo, Brazil, and Addis Ababa, Ethiopia to São Paulo, Brazil[49]. Brazil is currently the most common point of entry into South America for illicit African migrants, both because of these air connections with Africa and because of its loose visa requirements and significant corruption[54].

Depending upon their point of origin, the smuggled bioterrorist could leverage human smuggling routes within Africa to depart either from the Western or the Eastern half of the continent when traveling to South America. Those originating in the southern part of the continent could leverage either route.

3.3.2. *West and Central Africa.* Terrorists originating from West or Central Africa could debark the continent by either Addis Ababa or Luanda. Eastward smuggling routes into Ethiopia are rare, as most migrant flows from the region move northward with North Africa or Europe as a final destination[55] (Figure 4A). Therefore, air travel using false documents may be the most effective way to reach Addis Ababa. Smuggled terrorists intending to depart for South America via Angola could also face a challenge utilizing human smuggling routes, for the same reason. However, because visa-free movement is permissible among the 15 nations comprising the Economic Community of West African States (ECOWAS)[56], licit travel through the region could be secured as far south as the border between Nigeria and Cameroon. Human smuggling routes in the central portion of Africa's West coast, including Cameroon, Gabon, Equatorial Guinea, the Republic of Congo, and the DRC, are less well characterized. Operations are likely very local in nature, although there is a, "near total absence of data[57]" on regional migrant smuggling in this region. Routes are typically bi-directional land routes via unsecured and informal border crossing points, and the distinction between human smuggling and human trafficking in this region are blurred.

These routes are typically used for sex trafficking or labor exploitation. The area is also characterized by significant conflict[58-62] (Figure 4B). Deep, local knowledge of the area would likely be required to secure covert passage to Luanda.

3.3.3.*East Africa.* Potential bioterrorists from the “horn of Africa” would likely follow the beginnings of the “Eastern Route,” used by migrants to travel northward[63, 64], and use Addis Ababa as an exit point to the West. The city is considered a hub of migrant flows out of this region, and human smuggling activities are common[65]. The smuggling routes used in this region typically comprise migrants fleeing conflict or famine, *en route* to North Africa and Europe. The principal land routes from Somalia to Ethiopia typically cross the Tug Wajaale border crossing and enter Ethiopia in the North[65]. The border of Eritrea and Ethiopia is a conflict zone[66]. The Global Initiative Against Transnational Organized Crime notes that, “Crossing from Eritrea to Ethiopia is considered as an act of treason, and a shoot to kill policy is implemented across the heavily militarized border with Ethiopia. Migrant smuggling is therefore embedded into the core of survival in the country in its present context[65].” Land crossings from Sudan would likely occur either in the Gedaref region[31, 65], where large refugee camps are largely ignored by the governments. Other, common crossing points are Metemma and Humera[67, 68], near the contested Al Fashaga border region[69]. The border between Ethiopia and South Sudan is porous, but armed, local conflicts are common[70]. Local smuggling would need to be coordinated. A significant point of transit between Kenya and Ethiopia is the cross-border city of Moyale[66-68], although other, local border crossing points are also used. Crossing from Djibouti would likely occur at Galafi[67, 68] or Dewele[66] (Figure 4C).

3.3.4.*Human Smuggling by Sea.* Very little data regarding attempted transatlantic smuggling from Africa to South America by sea is reported. The UNODC Issue Paper on Smuggling of Migrants by Sea[71] makes no mention of smuggling to South America, and the International Maritime Organization’s Inter-agency Platform for Information Sharing on Migrant Smuggling by Sea [72] reports no incidents of interdicted, sea-based human smuggling into South America in its publicly-available dataset. The lack of data suggests that this method of trans-Atlantic human smuggling is not common. Notwithstanding, Costa Rican authorities have reportedly identified sea-based routes of transit from West Africa to South and Central

America[73, 74]. Moreover, licit transatlantic passenger travel can actually be booked aboard cargo vessels[75], and corruption in such passages could facilitate human smuggling. Additionally, incidental reports of tragedies and near-tragedies verify that migrants do attempt to cross from Africa to South America by sea[76, 77].

3.3.5. *Synthesis.* A potential bioterrorist originating in or transiting through Africa would have two options for debarkation ports on a direct, trans-Atlantic flight: Luanda or Addis Ababa. Human smuggling occurs in both of these areas, although the networks are not well characterized and primarily serve refugees fleeing poverty and conflict. A bioterrorist could leverage these routes to transit Africa and exit to South America, but they would likely need a high degree of local knowledge. Arrival in Brazil would likely facilitate entry using false documents, and, from there, the terrorist could travel north.

Bensman conducted an extensive review of case information from 19 U.S. court prosecutions of SIA smugglers[37]. Included in his analysis was data regarding the specific routes taken by these smugglers. A graphical summary is presented in Figure 5. This analysis suggests that the routes discussed above are practical, as they have actually been utilized by human smugglers in an attempt to move high-risk foreign nationals covertly into the United States.

While these transit routes are practical and could be leveraged by a bioterrorist originating in South Asia, Africa, or the Middle East, acquisition of a biological agent in these regions for smuggling on their person would be difficult. This is primarily because all of the routes rely on air travel for crossing the Atlantic Ocean. Accordingly, the bioterrorist would have one of four options. First, they could develop a strategy for concealing the agent during air travel and border security screening. Second, they could arrange a one-off, illicit, Atlantic crossing by sea. Third, they could coordinate separate, parallel smuggling of the agent into South America via an air or maritime cargo route. Fourth, they could simply acquire an agent while in South America. Of these, the fourth seems least difficult and least risky. Moreover, it opens the opportunity for air travel from their point of origin in South America. This would decrease the time, risk, and cost of land-based travel throughout the Middle East or Africa. This conclusion is of strategic importance when considering the logistics of a potential bioterror attack on U.S. soil.

3.4. Human Smuggling through South and Central America

3.4.1. *Points of Entry.* Brazil is currently the most common point of entry for smuggled Africans into South America, both because of its accessibility, its relatively loose refugee laws and visa requirements, and its corruption[78]. It would also be the most likely point of entry in the aforementioned scenarios, because the majority of direct, international flights from Africa and the Middle East arrive in São Paulo[49]. São Paulo also typically serves as the logistic and financial hub for coordinating northward human smuggling from South America. As is often the case in human smuggling operations, governmental corruption in Brazil helps to enable these illicit movements by facilitating document fraud[78]. Alternately, a potential bioterrorist wishing to enter the U.S. illicitly via the Southern border who did not intend to acquire a biological agent in South America could also elect to be smuggled from Turkey (§3.2.2) to Central America, further reducing the overland transit burden.

At present, direct transatlantic flights from the aforementioned debarkation ports to Central and South America include[49]:

Istanbul → São Paulo	Istanbul → Havana
Istanbul → Caracas	Luanda → São Paulo
Istanbul → Bogotá	Addis Ababa → São Paulo
Istanbul → Panama City	Dubai → Rio De Janeiro
Istanbul → Cancun	Dubai → São Paulo
Istanbul → Mexico City	

3.4.2. *Transiting South America.* Once a smuggled individual has successfully entered Brazil using a false travel document, a human smuggler in São Paulo typically coordinates the entire travel route to the U.S. Southern border. This includes collecting funds from the smuggled individual and distributing it to contacts who will facilitate movement throughout the route[78, 79]. A potential bioterrorist could also detour here to acquire an agent elsewhere in South America, as the MERCOSUR regional integration arrangement has eliminated visa requirements throughout most of the continent[1]. The route out of South America generally includes overland transit through Brazil, *en route* to its borders with either Colombia or Northern Peru. Here, illegal border crossing points, known as “trochas,” are used by smugglers (“coyotes,” “chuteros,” “chamberos,” “polleros,” or “trocheros”) to move the smuggled persons across the international border[1, 80]. Colombia is traversed by land, typically toward the city of Turbo. Turbo is, “Colombia’s last major outpost of civilization before the border with Panama[81].” Supplies are usually acquired here for what

is arguably the most dangerous and difficult part of the transit – the trip across the Darién Gap.

In Turbo, smuggled individuals and their smugglers board open boats to cross the Gulf of Urabá by water, arriving in the Colombian town of Capurganá. This town is still technically within Colombia, but it was rebel-held territory during the country's civil war and is now controlled by the Gulf Clan mafia[82]. Human smugglers make payments to this group to ensure safe entry into the roadless, 60-mile stretch of jungle at the border of Colombia and Panama that is known as the Darién Gap[81] (Figure 6A).

3.4.3. *Crossing the Darién Gap.* “Guides” depart with smuggled migrants from Capurganá for the 60-mile foot trek through the infamous jungle that separates South from Central America and Colombia from Panama. This stretch has no roads, many dangerous insects and animals, and numerous, encamped bands of various guerrillas and criminal gangs. Robbery, assault, rape, theft, and death are common on this part of the trek[81, 83]. Narcotics are also trafficked through the Darién Gap, although human smugglers have cleared a separate jungle route that runs north of the narco-trafficking pathway in the interest of safety[82]. Migrants exiting the Gap who are detected by Panamanian authorities may be detained in refugee camps, or they may be refused entry based on a daily quota system and sent back across the Gap. Those who successfully enter Panama often stay at local homes, where a new group of smugglers arrange rest, reprovisioning, and onward travel through Central America[82].

3.4.4. *Transiting Central America.* After entering Panama, transit by car is typically used to move smuggled individuals to the border with Costa Rica. Corrupt border guards generally facilitate entry, and travel then continues by car to the border with Nicaragua[82]. Nicaragua can be crossed by land or largely circumvented by boat, and, once again, corruption among border guards facilitates transit. Alternately, jungle routes are used here by some smugglers[82, 84]. Smuggled individuals then traverse Honduras and Guatemala by car or bus.

The next, significant step is exiting Guatemala and crossing into Mexico. This border is primarily jungle, and covert routes involving cars, motor vehicles, or foot transit are used. The cities of Tapachula, Tenosique, or Chetumal are the primary cities into which smuggled

persons enter. From here, overland transit by motor vehicle proceeds northward, often via Mexico City[1], to the U.S.-Mexico Border (Figure 6B).

3.5. Entering the United States.

Common locales from which individuals are smuggled from Mexico into the United States are the border towns of Tijuana, Nogales, Matamoros, Reynosa, Ciudad Juarez, and Nuevo Laredo[1]. In FY 2021 there were 1,659,206 documented encounters between migrants and U.S. authorities at the Southern Border[85], which suggests that attempts at illicit crossings here are common. For a potential bioterrorist, particularly one who is actively transporting a biological agent, covert crossings would be essential. Such crossings tend to be either on foot (across poorly-monitored areas, facilitated by “coyotes”) or across natural bodies of water.

Alternately, for a potential terrorist without a concealed biological agent but for whom no other, legal means of entry was possible, the path of least resistance would likely be to destroy any identifying information and to present themselves to a U.S. border guard to request asylum[37]. Provided their biometrics did not trigger a criminal database hit, they would be taken into the U.S., processed, and ultimately released pending legal proceedings[7]. U.S. regulations regarding detention, release, and return to Mexico at the U.S. border are in a constant state of flux, and current policies are closely monitored by human smugglers. At this point, either covertly or through asylum fraud, the bioterrorist has arrived on U.S. soil. Further discussion of illicit transit within the U.S. is beyond the scope of this analysis.

4. Summary – Scenarios

Based on this analysis, it is possible to define several scenarios in which a bioterrorist may leverage human smuggling routes and practices to travel from a point of origin in South Asia, Africa, or the Middle East to the U.S. These scenarios, including key, potential logistical issues, are summarized below.

4.1. Capable of legal entry into the U.S. The simplest and fastest route for a bioterrorist who is capable of legal entry into the U.S. on a tourist, student, or other visa would be to travel legally by air. Those desiring to stay illicitly in the U.S. could then overstay their visa (§2.3).

4.2. Not capable of legal entry into the U.S. Attempting to enter the U.S. using false documents is difficult due to the training of U.S. border agents and the heavy integration of technology and biometrics[13, 42] into the entry process for foreign nationals. Even without a biological agent in tow, the potential bioterrorist would need to attempt illicit entry via the U.S. Southern border.

4.2.1.Full access to false documents. An optimal strategy here would be to first obtain false documents (as necessary) that would allow air travel from their point of origin to an exit point in Africa or the Middle East. Exit points with direct flights to the South-Western hemisphere include Addis Ababa, Luanda, Istanbul, and Dubai. The simplest route would be to fly directly from Istanbul to Mexico City, assuming appropriate, false documents could be obtained that would allow entry into Mexico. This would obviate the need to cross South America and the Darién Gap. From here, the terrorist could travel legally by ground to the U.S.-Mexico border. Next, they would destroy their identifying documents and present themselves at a U.S. border checkpoint to make a request for asylum. After processing, the terrorist would be granted entry into the U.S. pending legal proceedings and could disappear into the nation's interior. This is a classic scenario of asylum abuse (§2.3).

4.2.2.Limited Access to False Documents. If documents could not be obtained that permitted access to Mexico by air, then a different point of access to the South-Western hemisphere would need to be selected. The most likely would be São Paulo, Brazil[78]. From here the terrorist could leverage human smuggling routes to travel northward through South and Central America and into Mexico. Additionally, it is feasible that a bioterrorist could detour at this stage to a different South American country to acquire a bioagent, either from an illicit contact or from a natural reservoir[22], before continuing northward. They would then proceed as described in §4.2.1.

4.2.3.Covert Travel Required in the Eastern Hemisphere. If covert travel within the South Asia – Middle East – Africa region was required, then human trafficking routes in the region could be leveraged to facilitate regional travel to an exit point, as described in detail above (§3.2, §3.3). A terrorist with a point of origin in South Asia or the Middle East would most likely use Turkey as an exit point, as illicit travel between the Middle East and Africa would bottleneck at the Sinai Peninsula, where even human smuggling may be difficult (§3.2.3).

Conversely, a terrorist originating in Africa could travel either westward to Luanda or eastward to Addis Ababa for exit. At least some of this travel could be licit if the ECOWAS zone was involved[56], although the remaining travel would be somewhat “against the grain” of the traditional, northward human smuggling routes that are dominant in Africa. This latter circumstance could present some logistical challenges for covert travel.

4.3. Cannot Travel by Air. There are at least two potential reasons that a bioterrorist may not be able to use air transportation of any kind. First, they could already be logged in an international criminal database with biometric information. In this case, any entry point that may leverage biometrics (e.g., airports) would need to be avoided. Second, they may be actively transporting a biological agent on their person or with their personal effects that was acquired in the Eastern hemisphere. In this case, airport security checkpoints would likely pose a significant risk of detection and may need to be avoided. Implicit in either scenario is that the terrorist could not present themselves for asylum at the U.S. border. In this circumstance, a fully covert journey would be required.

This scenario is complicated, but it is theoretically achievable using current human trafficking routes and techniques. First, the South Asia – Middle East – Africa region could be traversed as described in §3.3.1-3.3.3. Next, the Atlantic Ocean could be crossed by sea, as described in §3.3.4. Thereafter, the South and Central American regions could be traversed, as described in §3.4. Finally, covert entry across the U.S.-Mexico border could be facilitated by human smugglers, as described in §3.5.

A bioterrorist transporting a biological agent would also have to be cognizant of the time that such a trip would take if their agent was not thermostable and had to be transported cold. However, current cold transport technologies could maintain appropriate temperatures for at least 45-60 days, which could be adequate time for a carefully-coordinated transit to take place. Alternately, a thermostable agent could be selected (§2.5.2).

5. Conclusion

A bioterrorist planning an attack on U.S. soil has the unique advantage that a quantity of biological agent small enough to be transported on their person could produce widespread casualties. With appropriate selection of the agent and the method of dissemination, such an attack could generate significant chaos and loss of life, and could even catalyze a self-sustaining

epidemic or pandemic. If the bioterrorist could move themselves and their agent covertly from a point of easy acquisition to a target area within the U.S., the consequences could be catastrophic. Because of the small size of the agent, this type of covert movement would be, essentially, an exercise in human smuggling. Accordingly, this scenario represents a practical example of potential convergence of terrorism and transnational crime.

This analysis has examined the process of covert human smuggling from a point of origin in South Asia, Africa, or the Middle East into the United States via South and Central America. It proposes that this strategy could be used by a bioterrorist to smuggle themselves and their weapon into the U.S., and it examines the context in which such an act could transpire. Thereafter, it presents a detailed analysis of human smuggling routes and techniques currently used in these regions for the illicit movement of irregular migrants and considers how these could be repurposed by a bioterrorist. Finally, it summarizes the logistics of several scenarios for this type of convergence. The analysis demonstrates that, while this process would be complex to coordinate and to implement, it should be technically possible for such convergence to facilitate the requisite covert movements of people and biological agents necessary to perpetrate acts of bioterrorism on U.S. soil.

FIGURES

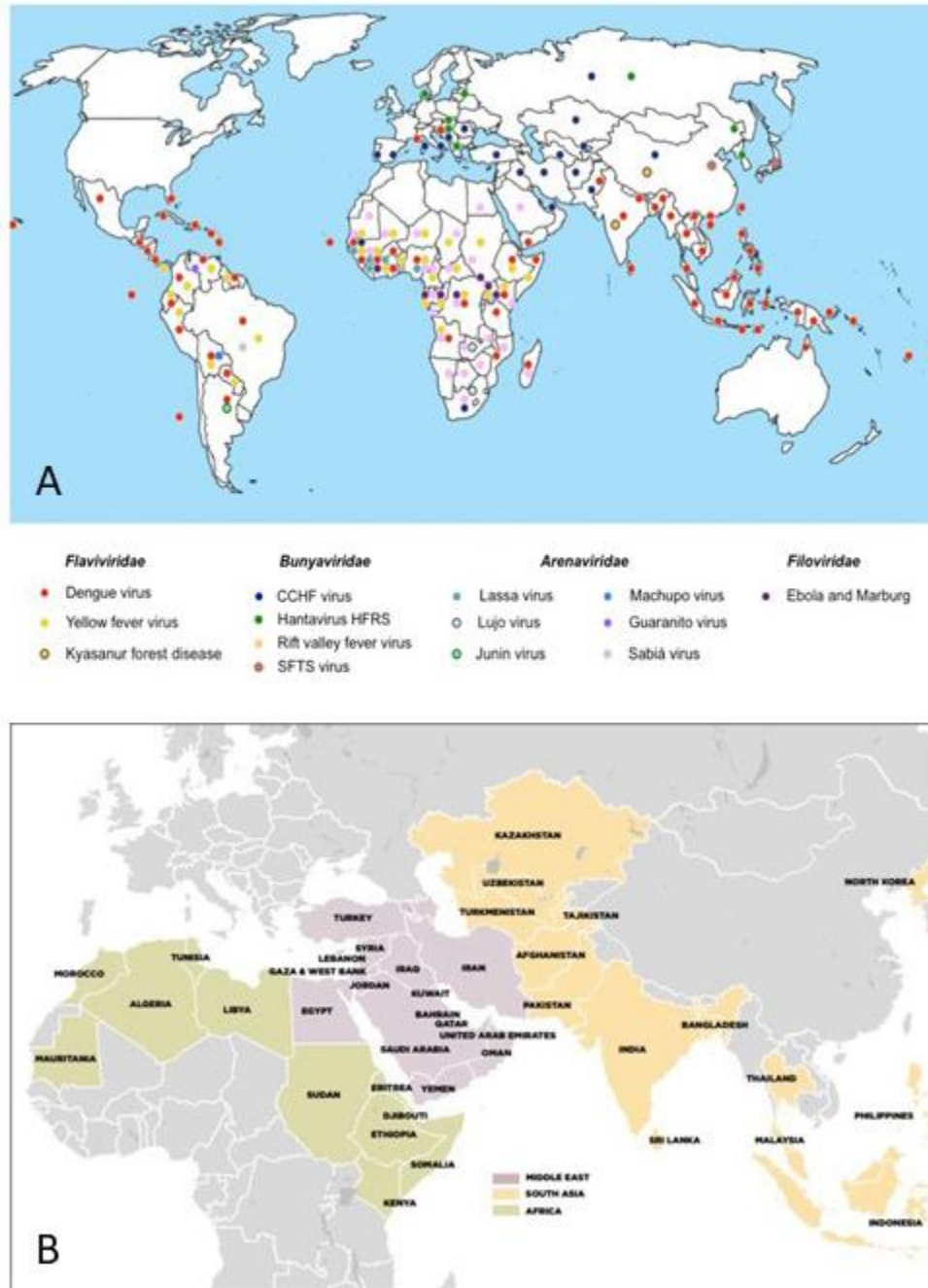


Figure 1: Overlap of Viral Hemorrhagic Fevers and U.S. Special Interest Alien "Countries of Interest"

1A: Geographic Distribution of Viral Hemorrhagic Fevers. From [22]

1B: "Countries of Interest." From [37]

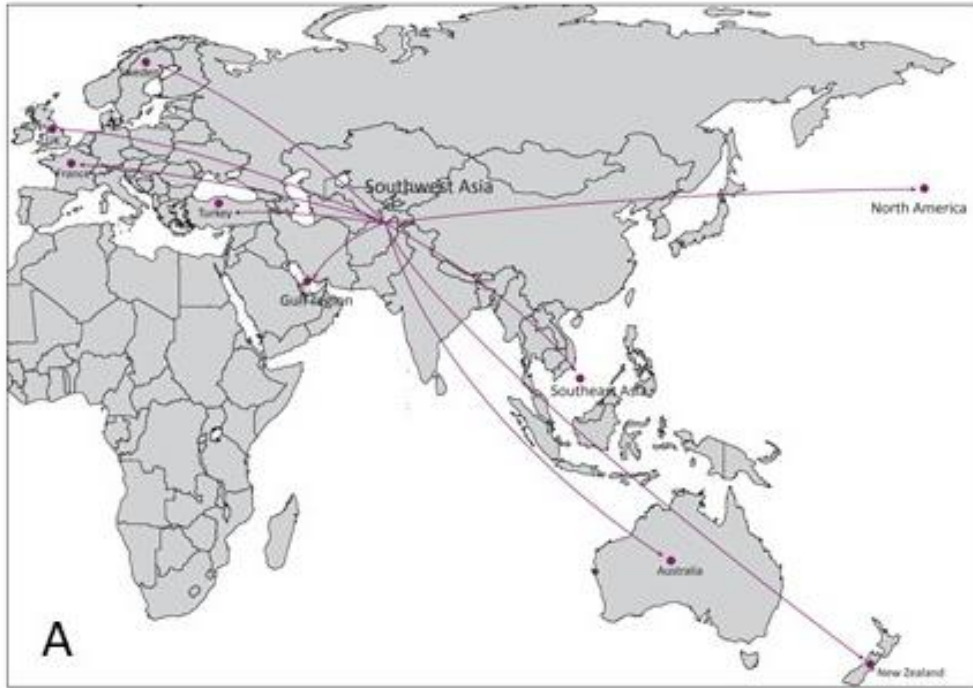


Figure 2: Human Smuggling Routes in South Asia

A: Southwest Asia

B: Southeast Asia

From [44]

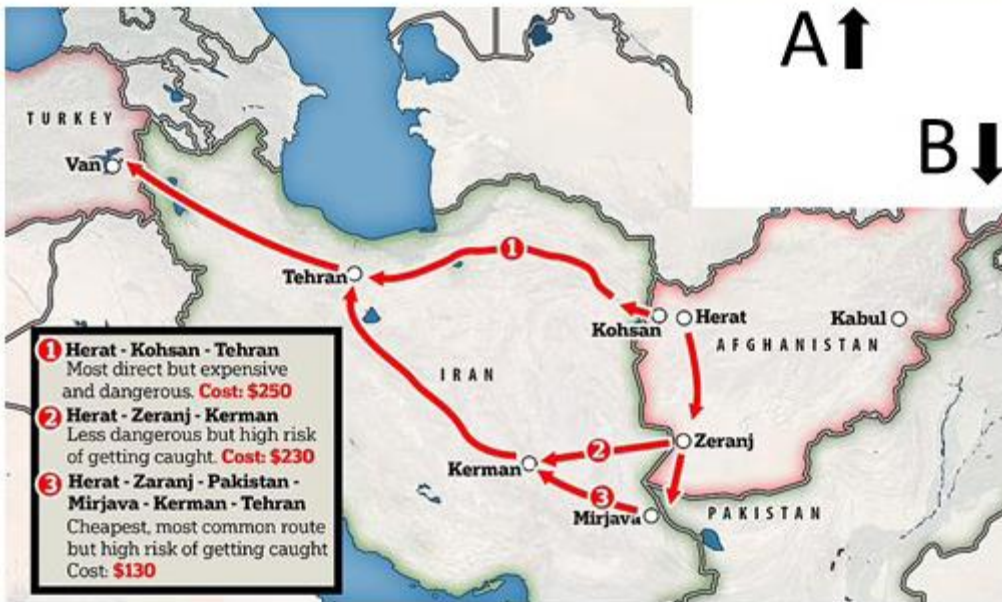
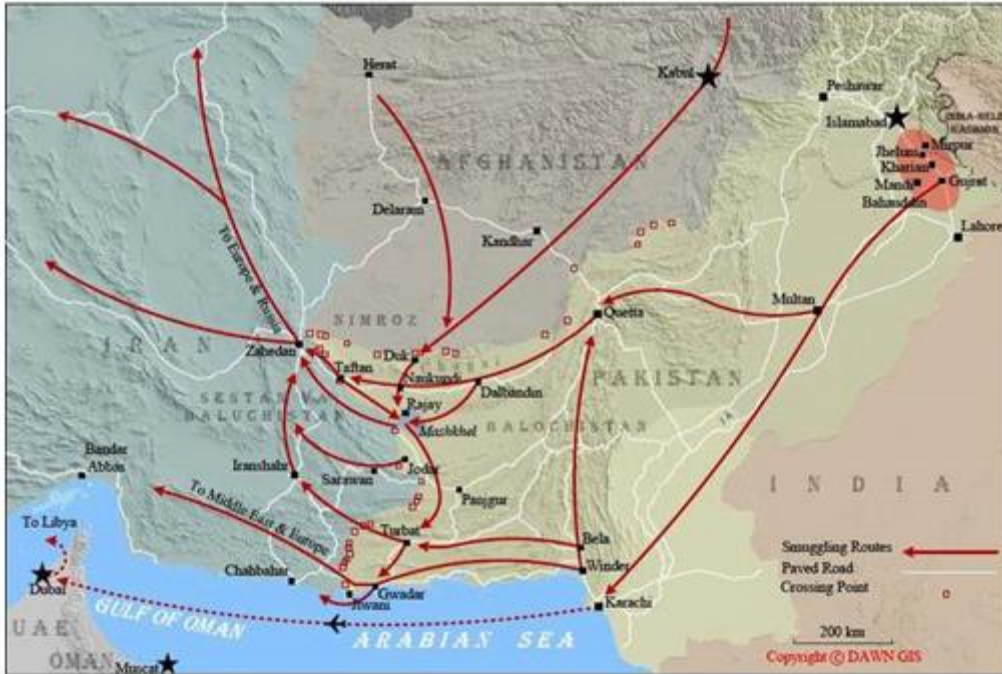


Figure 3: Human Smuggling Routes through South Asia and the Middle East

A: Southern Routes. From [45]

B: Northern Routes. From [47]

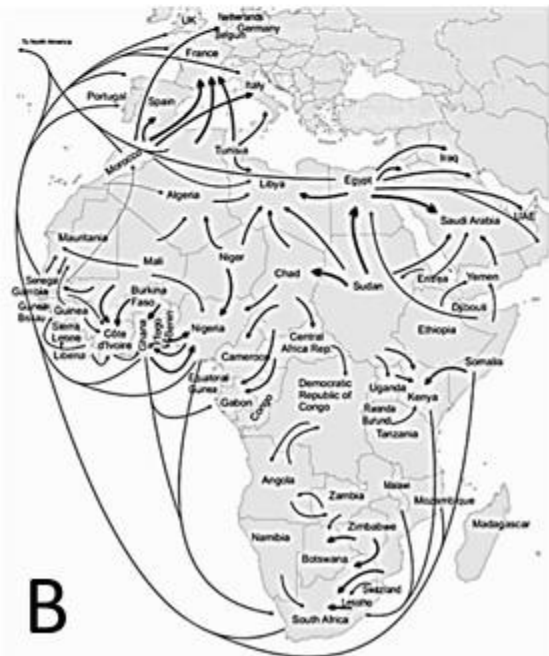
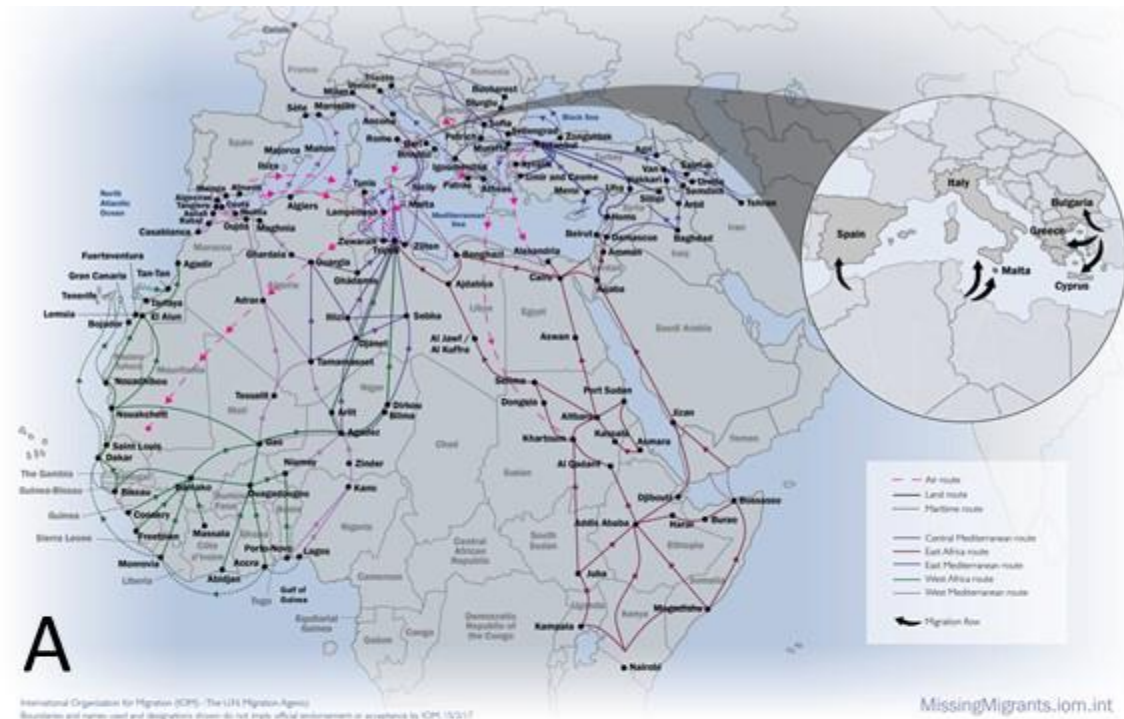


Figure 4: Human Smuggling Routes in Africa
 A: Routes in North Africa. From [55]
 B: Intra-African Migrant Flows. From [86]
 C: Routes in the Horn of Africa. From [63]

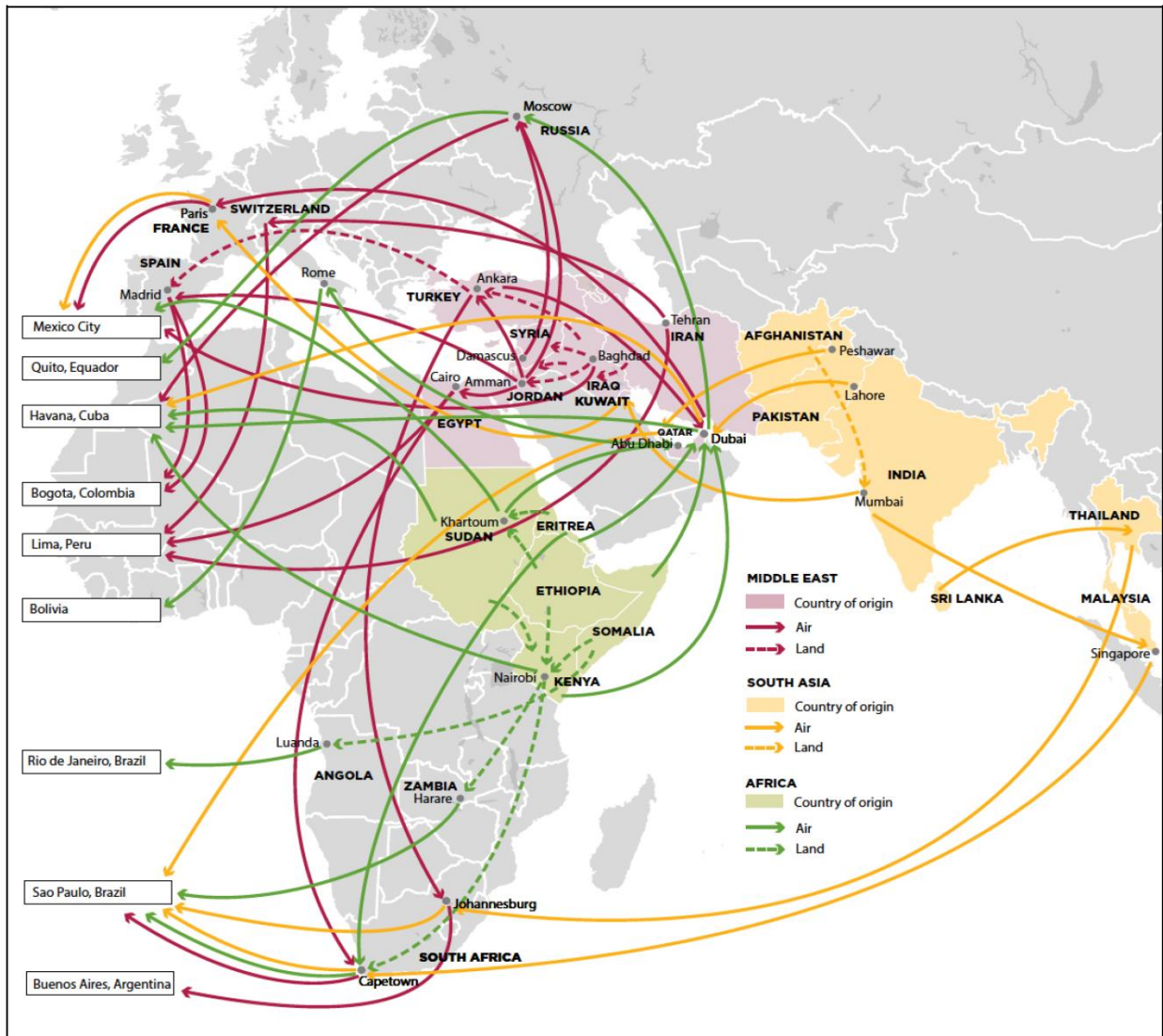


Figure 5: Departures from Middle East, Africa, and South Asia, and Initial Landings in the Western Hemisphere
From [37]



Figure 6: Human Smuggling Routes Through South and Central America
 A: South American Routes Northward from Brazil. From [81]
 B: Routes Through Central America. From [1]

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