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# Proposal for New Regulations in Private Biolabs

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**Note:** Much of this project proposal focuses on gaps found specifically within US laws, regulations and requirements, as these are the regulations that are found most readily online, as well as the most widely employed. It is noted that some regulations may not be public knowledge and kept private by laboratories.

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# Executive Summary

This project posits that the cause of lab leaks and their spread can be narrowed down to two main shortcomings: a) negligence, b) lack of transparency. The root cause for both of these is the lack of oversight for many of the labs working with highly virulent pathogens. Even though a pathogenic biorisk that is dangerous in and of itself (while possibly having been engineered to be more transmissible) would be restricted by stringent, international regulations and oversight, that is unfortunately not the case today. Indeed, established measures are in place to minimise the actions of malicious persons, in addition to every government's own regulations for biosafety labs. These policies are all put in place with the intention of promoting safety, but the fact remains that the measures currently enforced 1) are not enough to prevent negligence in labs, 2) often lack close monitoring by government authorities and 3) are not applicable in non-government-funded labs.

This proposal aims to explore the potential consequences of lab leaks, the gaps in current measures, and what can be done to improve them. It will present an approach involving tighter control on biosafety labs (especially in BSL-3s and 4s), coupled with a registration system to effectively increase accountability while reducing the likelihood of a pandemic caused by exposure to lab-engineered pathogens.

# Introduction

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*Biosecurity – protection, control, accountability and other measures to prevent the loss, misuse, or release of biological agents, as well as unauthorized access to or retention of such material.*

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Biosecurity is an issue that has garnered much attention, especially after the COVID-19 pandemic. Now, the urgency for robust biosecurity measures has never been more pronounced. With our world becoming increasingly globalised and interdependent, the effects of a pandemic could be truly devastating for society. In particular, the consequences of a lab-engineered, leaked pathogen could be unthinkable. Already, the possibility of this happening is not as close to zero as we might expect, as evidenced by the numerous outbreaks from biosafety labs that occurred just over the last two decades. These were, for the most part, small, scattered and largely unnoticed. However, a more dangerous pathogen could make its way out of containment and create unprecedented challenges for healthcare, food systems, education and socioeconomic equality, just like how the most recent pandemic has. If we don't take action, this isn't a risk, but an eventuality.

In particular, attention must be brought to biosafety labs (BSLs) across the world, especially biolabs of biosafety levels 3 and 4. BSL-3s handle microbes that can cause serious or potentially lethal disease through respiratory transmission (e.g. Mycobacterium tuberculosis). The small number of BSL-4 labs around the world handle the most dangerous and exotic pathogens that pose a high risk of aerosol-transmitted infections that frequently result in fatalities and without treatment or vaccines (e.g. Ebola). What's concerning is that because the U.S. government does not know the exact number of BSL-3 labs, the frequency of these leak incidents are not necessarily well-documented.

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# Problem Significance

## Dangers of Lab Leaks

*What technologies makes lab leaks a pressing existential risk?*

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*Dual-Use Research of Concern (DURC) – research that, based on current understanding, can be reasonably anticipated to provide knowledge or technologies that could be directly misapplied to pose a significant threat with broad consequences for public health and safety.*

*Gain of Function (GoF) – selection process involving an alteration of genotypes and their resulting phenotypes*

*Enhanced Potential Pandemic Pathogens (ePPP) – pathogens that may be anticipated to create, transfer or use potential pandemic pathogens resulting from the enhancement of a pathogen's transmissibility and/or virulence in humans*

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With the global biotech industry expected to reach USD 465.9bn in 2024, biotechnology has emerged as a field crucial for development that can be used for many beneficial purposes. Gene editing technologies like CRISPR, for example, have become increasingly popular after showing promise in correcting genetic disorders. However, biotech can also create new biological risks—both accidental and deliberate. This is especially pertinent in areas involving synthetic biology, where the creation of purposefully engineered and mutated organisms could potentially escape containment.

One such category of this is the development of dual-use technologies. The knowledge and tools employed in biotechnology can certainly be used and developed for the benefit of humanity, but can also be repurposed and misused to create weapons. This includes the synthesis of deadly pathogens or the enhancement of existing ones to make them more virulent and/or resistant to existing treatments (also known as ePPPs, enhanced potential pandemic pathogens). With little to no existing immunity against them in human populations because of their rarity, these biological agents pose a severe risk for humanity.

Take, for instance, the H5N1 Influenza A virus: a form of bird flu with a mortality rate of more than 50 percent. The experiment ultimately resulted in the synthesis of a weakened form of H5N1 capable of transmission between ferrets that shared similar common features with humans for infection – something not previously achievable by the wild-type virus. This meant the virus could have been able to spread in humans as well. Although it is possible to say we now know which changes to the virus could make human-to-human transmission probable, there are clear downsides, too. To reach the conclusion involved actually creating a virus that can use humans as vectors. Not only that, but the experiment took place in a lab that experienced multiple safety breaches that were not reported to state and local health officials. This only highlights the need for stricter protocol in the case of a leak incident such as this.

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# Consequences of Lab Leaks

Real-world incidents have put the costs of a lab leaked incident in perspective to highlight just how serious this issue is. Not only can these incidents claim human lives, but they can also have massive economic impacts.

One particular example is the foot and mouth disease lab leak in the United Kingdom in 2007. The virus escaped from the Pirbright Institute, affecting nearby livestock. There were heavy economic losses due to the culling of animals as well as from the trade restrictions on UK livestock products, along with clean-up and disinfection operations. A net total of 2160 animals were culled in the affected zones over the two-month outbreak period. The total cost of containment and livestock loss is estimated by experts to be approximately £47 million.

Somewhat fortunately, foot and mouth disease is generally considered to be a minor illness that rarely causes death. Yet, the cost figure of the above is already in the tens of millions of pounds, which only calls attention to the possible consequences of a highly lethal and infectious pathogen.

# Current Problems

## Equipment and Negligence

Numerous safety breaches occur every year in biological research labs worldwide as researchers handle dangerous pathogens. Lab workers risk being bitten by infected animals, being stuck by contaminated needles, and being exposed to pathogen-containing fluids. These risks are only compounded by protective gear and PPE malfunctions, as well as the shortcomings of critical biosafety systems within these labs, and exacerbated in facilities with outdated equipment or insufficient training for personnel (some statistics can be found in Appendix [C]). In fact, nearly 70% of the known causes of accidental leaks were due to *preventable* procedural errors.

Human error is another significant factor, as safety protocols are sometimes disregarded, even when dealing with potentially pandemic-causing pathogens. In fact, a scoping review using publicly available, peer-reviewed media has reported the number of laboratory-acquired infections (LAIs) and accidental pathogen escape from laboratory settings (APELS). LAIs were identified in 309 individuals in 94 reports for 51 pathogens, while 16 APELS were reported. The pathogens leaked included Ebola, Bacillus anthracis, SARS-CoV, poliovirus, and H5N1, among other highly infectious and virulent biological agents. As is the case with any review using publicly available information, the results are reliant on active reporting, so the numbers reported are likely to be much greater than the true number. This pervasive lack of transparency and rigorous oversight in laboratory settings only emphasises the need for formalised global reporting to better understand the frequency and circumstances of these incidents, and to improve biocontainment protocols.

Without comprehensive regulations that can be applied to every lab, there is a significantly higher risk of unsafe practices when handling biological agents.

### Private Labs

Lab leaks have occurred around the world in both government-owned and private labs. The fact that this is happening even in labs that have strict government management and supervision, such as in the United States, only highlights the need for better regulations across all of them. Although some measures are legally mandated in the States, there are several gaps when it comes to private labs. Most of the measures issued by federal science agencies are mandatory only if the United States funds the research. Privately funded research (and research that doesn't involve select agents) may therefore not be covered by certain U.S. oversight mechanisms.

Sometimes referred to as "invisible labs", these biolabs in the U.S. are overseen by a patchwork of partially overlapping regulations. While some biosafety and biosecurity oversight mechanisms are required by law, others are merely guidance and recommendations. These "invisible" labs have more leeway to work with pathogens that could cause outbreaks, severe illness, and death. A report by Gryphon Scientific, a biosafety and public health consultancy, estimated that about 25% of human pathogen research activities in the U.S. are performed by labs owned by private organisations, and around 25% of these private organisations are "invisible". Though these kinds of labs make up a seemingly small share of the many labs currently in operation within the U.S., government oversight of them is essential, as relying on voluntary adoption of protocol isn't sufficient protection from pathogens that pose such massive existential risks.

## The Status Quo

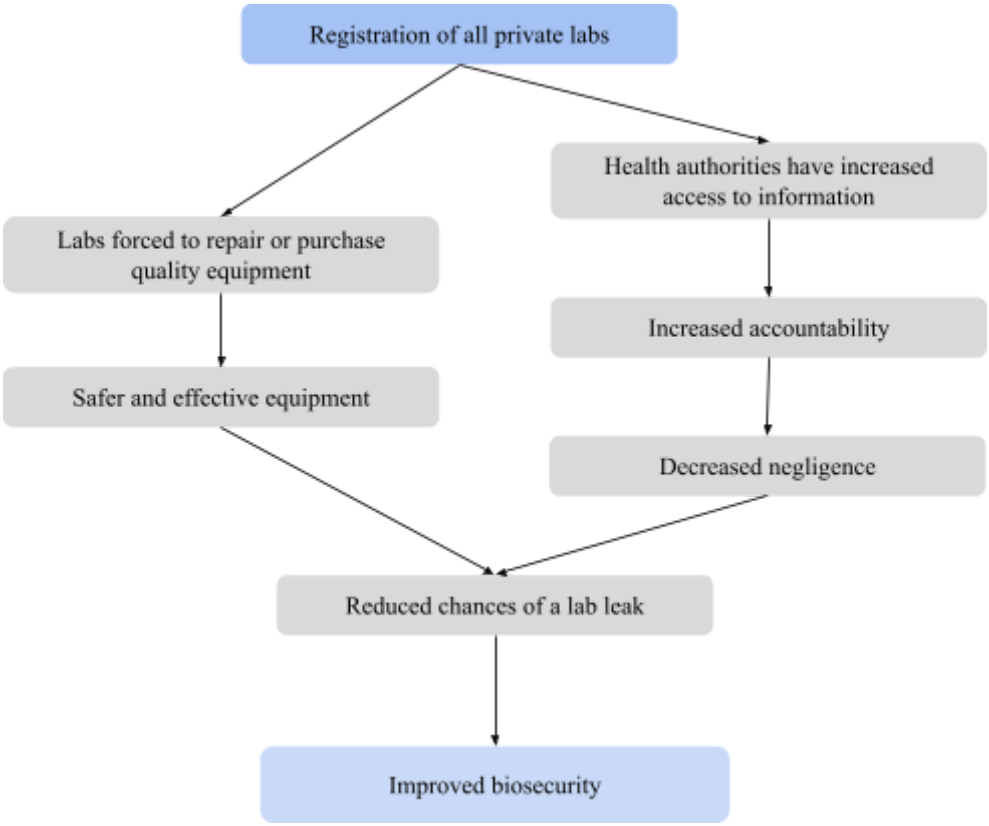
At a United States Congress meeting in April 2023, Dr Casagrande (an expert in the possible misuse of advanced biotechnology) stated that because "different countries have different biosafety and biosecurity rules", "it would be advantageous to try and harmonise those biosafety and biosecurity standards in order for us to facilitate international cooperation". Dr Casagrande also proposed that "privately-funded labs doing work with certain pathogens [should be] subject to similar oversight requirements as publicly-funded ones". With "labs across the U.S. [having] different protocols for what happens after an exposure", Dr Casagrande also recommends that there should be more guidance and standards that are employed across *all* BSL-3 and BSL-4s.

In January 2023, a meeting was held by the National Science Advisory Board for Biosecurity (NSABB), consisting of a panel of scientists and scholars advising the federal government on issues related to bio-research and their related risks. Similarly, they also advocated for "enhanced oversight" of non-federally-funded research, noting that "such oversight would help to enhance federal awareness of relevant research".

Recommendations included making sure that research is given extra care and consideration, as well as developing standard operating procedures for all institutions to ensure unnecessary risks have been eliminated. There was a call to consider the development of an analogous oversight framework for research involving enhanced animal or plant pathogens. Tom Inglesby, M.D., director of the Johns Hopkins Center for Health Security, said that the United States government (USG) should engage with

other governments on shared approaches. In addition to this, there were recommendations to ensure that all research meets United States oversight policy frameworks regardless of funding source.

In a nutshell, scientists generally agreed that there should be a) a unified, international oversight framework and b) a system implemented on all labs, both government-funded (public) and private.




## Stakeholders

| Stakeholder | Involvement |
|---|---|
| Government Agencies and Regulators (e.g. CDC, NIH, FDA etc. or equivalent) | Directly involved in implementing and enforcing any new biosecurity measures proposed. |
| Laboratory Facilities (especially BSL-3 and BSL-4 Labs in research institutions, universities and private companies) | Directly affected by new regulations by having to comply with potentially new standards, undergoing more rigorous inspections, and potentially face stricter penalties for non-compliance |
| Scientists and Researchers | Work practices, safety measures, and research freedom could be influenced by new regulations |
| Local Communities (especially those located near | Have a vested interest in the enhanced safety |

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|---|---|
| high-containment laboratories) | measures being implemented, as improved biosecurity measures could reduce the risk of accidental pathogen release, protecting public health |
| Private Sector Biotech and Pharmaceutical Companies (particularly those running their own research labs) | Might need to adjust their operations to comply with new regulations, but can also be seen as partners in developing and implementing new biosecurity technologies. |

## Current Measures

Below is a list of ongoing, well-enforced policies that this proposal aims to build upon. They will be elaborated on to describe their fit with this project's goals:

- Federal select agents
    - Delineates the level of lab safety pathogens should be handled in
- Safety Stand Down 2014
- Biosafety manuals currently in use
- HHS P3CO policy
    - Conducting of approved research in an appropriate laboratory with stringent oversight and biosafety and biosecurity controls.
- WHO's One Health initiative
- Global BioLabs Initiative

## Current Roadblocks

*Why don't policies address the problems mentioned above? What's stopping measures like these from being implemented, and how does this proposal aim to tackle them?*

| Roadblock | Solution |
|---|---|
| Technological advances<br>• Often lags behind technological advances and emerging threats<br>• Logistical challenges in consistently and accurately monitoring large-scale operations. | • By creating a unified and transparent system, this project is applicable to all labs across the world, regardless of the pathogens being handled.<br>• By initially focusing on a pilot program, this project proposes a scalable approach that can be expanded as resources permit. This makes it more feasible for governments to implement the measures without needing to secure massive upfront investments. |
| Funding limitations<br>• Implementing comprehensive systems | • Emphasis on enforcing policies on |

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|---|---|
| require significant financial resources<br>● Many countries, especially those with limited budgets, may not prioritise these investments | targeted labs allows for a more efficient use of resources by concentrating efforts on the most critical areas<br>● Outlining the potential costs of a lab-leaked pandemic versus the costs of implementing suggested measures, in order to demonstrate that the latter is a more economically sound investment. |
| <u>Lack of awareness</u><br>● Policymakers often underestimate the need for stringent biosecurity measures because of the rarity of these events<br>● After periods without major incidents, there is a tendency to become complacent. The perception that current measures are "good enough" can lead to resistance against adopting more stringent policies. | ● Project places heavy emphasis on the potentially catastrophic consequences of lab leaks and the importance of preventative measures<br>● Proposal aims to provide a detailed analysis of why current measures have failed and how proposed solutions could mitigate these risks |
| <u>Resistance</u><br>● Concerns that policies could hinder scientific progress, increase administrative burdens, or lead to reduced funding for research.<br>● Different countries have varying standards, regulations, and enforcement capabilities<br>● Political tensions, lack of trust, and differing national interests can impede necessary cooperation. | ● By proposing to build on current biosecurity policies, this project suggests a gradual and evolutionary approach rather than a complete overhaul<br>● Mitigates bureaucratic inertia by integrating new measures into existing frameworks, making it easier for policymakers to adopt and implement them<br>● Project focuses on national policies, but the principles it promotes could be adapted for international use<br>○ By setting a precedent, this project could encourage other countries to adopt similar measures |

# Proposal

In addition to working with local health organisations in countries that have access to BSL-3 and BSL-4s, this proposal also hopes to add to the World Health Organisation's (WHO) programs (e.g. One Health initiative). Its approach to prevent and respond to global health threats aligns well with this proposal. This proposal also hopes to make all the policies implemented transparent to the public.

## Registration of Private Labs

The mandatory registration of all facilities and laboratories, both public and private, working with any form of transmissible pathogen should be the first stepping stone in ensuring biosecurity against lab leaks.

Each country's government and relevant authorities should be able to account for every biological lab in the country and have access to important information about it. This makes risk management and accountability easier, as a central authority would be able to manage and respond to potential outbreaks quickly. If a registered lab reports an issue, authorities can have quick access to critical information about the lab's operations, personnel, and containment capabilities. These authorities include the Offices responsible for the nation's Health and Human Services. Over the course of a year, biolabs across a country not already registered with the country government or relevant authorities should submit the following information:

1. All species of pathogens or biological agents being kept.
2. Number of lab workers with access to the facility.
    a. Includes basic personal information (i.e. names and contact information) to make contact tracing easier in the event of a breach
3. Biosafety level of the highest-level laboratory in the facility.
4. Level of Access to equipment. To be able to report a Level of Access, all equipment must be fully functional and maintained regularly.

Below is a set of guidelines taken from the CDC of what equipment labs must have to be able to operate pathogens suitable to that biosafety level. As compared to current regulations that pose the below as recommendations, these will be made mandatory for lab activity to continue. The quantity of equipment should be decided by a risk assessment that is usually done in accordance to standard procedure before the start of an experiment or research project:

| BSL-1 Access | BSL-2 Access |
|---|---|
| • Personal Protective Equipment (PPE), including lab coats, gloves, eye protection<br>• Handwashing sinks<br>• Biohazard waste containers<br>• Sharps disposal container<br>• Doors to separate the working space from the rest of the facility | • All equipment detailed in Level I<br>• Class I biological safety cabinets (BSCs)<br>• Eyewash station<br>• Autoclaves<br>• Incinerators and/or other equipment that can decontaminate laboratory waste |
| **BSL-3 Access** | **BSL-4 Access** |
| • All equipment detailed in Level I and II<br>  ○ BSCs must be at least Class II<br>• Specialised ventilation system<br>  ○ Exhaust air cannot be recirculated<br>  ○ Laboratory must have sustained directional airflow by drawing air into the laboratory from clean areas towards potentially contaminated areas<br>• Sets of self-closing and locking doors for entrance | • All equipment detailed in Level I, II and III<br>  ○ BSCs must be at least Class III<br>• Laboratory isolated and restricted zone of the building<br>• Dedicated supply and exhaust air<br>• Vacuum lines<br>• Decontamination systems |

Examples of pathogens at each Access Level can be found in Appendix [B]

During this one year registration period, any laboratories that do not meet the level of access corresponding to their biosafety level must remedy that as soon as possible (i.e. if a BSL-4 lab only has BSL-3 Equipment Access, any missing equipment must be either purchased or repaired).

Given that there are currently no strict policies in place about equipment absolutely required in lower BSL levels, this one-year time period allows all labs sufficient time to take inventory and to make any necessary purchases or repairs to equipment before inspection takes place.

It would also be highly useful for there to be a mandatory registration and sign-in system for any external visitors that are not full-time or employed members of the lab. This maximises the reach of any contact tracing in the case that a lab personnel becomes ill after exposure. It also maximises accountability as all people going in and out of a lab is recorded.

## Inspection and Consequences

At the end of this one-year window, authorities will conduct a review of labs to ensure the correct information has been given and that all labs meet the Access Level corresponding to their biosafety level. This will work similarly to the 2014 Safety Stand Down that was conducted by multiple government institutions to identify biological select agents. Following this, laboratories must report any new acquisitions of biological agents. All information on acquisitions will be stored in a database (more in Appendix [D]), building upon the Federal Select Agent program that already exists in the United States. Unannounced inspections will be conducted approximately every half year by a dedicated task force to audit and inspect laboratory materials and equipment in order to check it against reported documentation.

If anything in the lab fails to meet the standards of its reported level of access (including maintenance and proper usage), a moratorium will be enforced on the lab until the necessary repairs and measures are taken. This ensures that all labs can fulfil the safety requirements detailed above, reducing the chance of a lab leak caused by faulty instruments and apparatus.

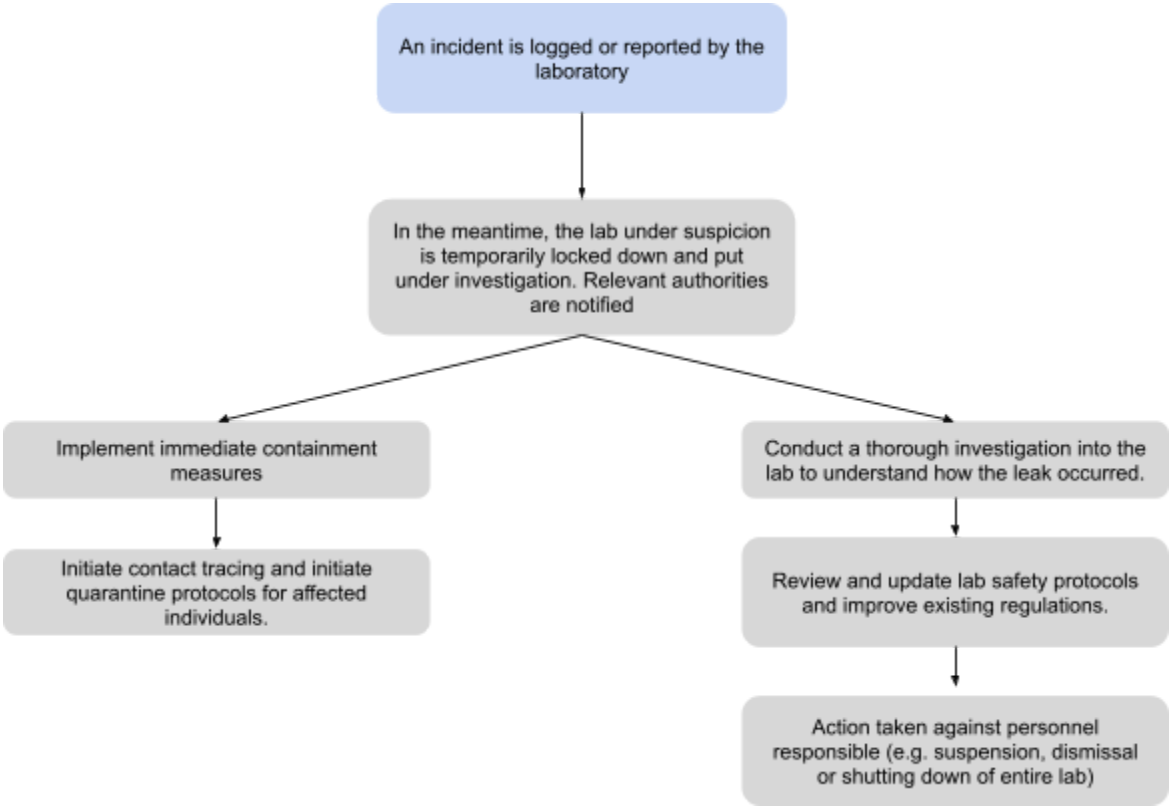
Any and all labs that are found to have reported incorrect data, been unable to meet their Access Level requirement or not reported at all will be put under investigation. Should the lab be found to be purposefully concealing or falsifying their information, it will be shut down immediately and fined. The length of the shut-down and cost of the fines will be decided by the authorities based on severity in addition to other factors like how well-equipped the lab is. This ensures that labs receiving a lot of funding cannot simply pay the fine and get away with no other consequence for under-reporting. Implementing these regulatory ramifications would deter laboratories from abstaining from reporting, as the costs of reporting are virtually zero, whereas the consequences for failing to report are harsh.

In every BSL-3 and BSL-4, basic medical surveillance should be done to ensure all individuals in the lab are physically fit for the nature and extent of the work to be undertaken, while also ensuring an accidental leak has not occurred. Should an employee fall ill, they should immediately be quarantined. All labs should aim to do this even if the employee's symptoms are not necessarily characteristic of, or consistent with, the pathogen they handle, as pathogens (particularly those that have undergone genetic changes that

leave their action in host organisms unknown) can manifest differently in hosts compared to regular strains.

## Containment

In the case of any leak, breach or case of accidental infection, private labs should report them to the local health organisation immediately so contact tracing can take place. Containment labs across the U.S. have different protocols for what happens after an exposure, especially in private labs. This is, again, partially due to a lack of sharing and communication of innovations or best practices. This proposal puts forward a general and uniform protocol for what should happen in the case of a suspected containment breach:




## Policy Reviews

After containment is successful, the relevant authorities should conduct a thorough investigation to understand how the leak might have occurred. Any lab safety protocols should be updated accordingly, with action taken against the personnel responsible for the breach. Depending on the number of personnel involved as well as the nature and severity of the breach, the severity of the action could range from a fine to the closure of the laboratory. This should be determined by local authorities.

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## Pilot Program

It would be unrealistic to have this proposal enforced in full immediately after approval, which is the reason this proposal suggests following a smaller-scale pilot program first to test feasibility, scalability, and impact. Since the United States already have some established regulations (e.g. Federal Select Agent program, OneHealth initiative, HHS P3CO policy etc.), implementing this program would simply be following precedent. This ensures the pilot program runs as smoothly as possible with minimal interference with scientific progress, as registration of labs and ensuring they operate with quality equipment does not affect lab activity and acts to enhance safety. For states like California, Maryland and New York, which contain the most biological labs, this is especially true. In contrast, a pilot program like this launching in countries like China, Russia, or Iran may be less feasible (Appendix [E]). After the year-long period used to register labs, experts would be able to see the scale at which this project needs to be carried out at. By enforcing this proposal on a smaller scale, it can be adapted, refined and improved before being launched as what could potentially be a global initiative.

# Timelines

*Gantt charts of milestones and deliverables (Q = quarter year), hopefully sometime within the next five years.*

**Development Chart:**

| | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 |
|---|---|---|---|---|---|---|---|---|
| Research and draft detailed protocol | | | | | | | | |
| Conduct meetings with stakeholders | | | | | | | | |
| Stakeholder review and feedback | | | | | | | | |
| Develop database and user interface | | | | | | | | |
| Finalise protocols | | | | | | | | |
| Roll out policies on pilot program labs | | | | | | | | |
| Evaluate pilot results | | | | | | | | |
| Review and refine protocols and processes | | | | | | | | |

**Implementation Chart**

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Assuming roll-out of pilot program in Q5

| | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Q11 | Q12 |
|---|---|---|---|---|---|---|---|---|
| Announcement of pilot program | | | | | | | | |
| Lab registration process | | | | | | | | |
| Inspection | | | | | | | | |
| Policy review process | | | | | | | | |
| Larger-scale roll out of project | | | | | | | | |

# Next Steps

- [x] ~~Speak with experts to improve policies~~
- [ ] Engage with key stakeholders (e.g. governments, international organisations, and the scientific community).
- [ ] Arrange for and secure funding and resources for establishment, development, and maintenance through governments, organisations like the WHO, UN, etc. and private sector partnerships.
- [ ] Establish a governing body and task force.
- [ ] Create a compliance strategy for enforcement of regulations and implementation of consequences.

# Theory of Change

| Proposal | Effects |
|---|---|
| Registration of private labs<br>• Currently not a mandatory process | • Government awareness of existence of these labs<br>• All labs can be held accountable in the event of a breach<br>• Risk analyses can be conducted by authorities for each lab, which could be helpful when it comes to approving DURC research |
| Mandatory adherence to BSL equipment list<br>• Currently only recommendations and reliant on voluntary adoption | • Reduces chance of faulty or unsafe apparatus being used that could cause procedural errors resulting in accidental leaks |
| Sign-in system for external personnel<br>• Not mandatory in every lab | • Allows for more efficient and maximised reach during contact tracing |

| | |
|---|---|
| | • Increased accountability in case of breach |
| Standardised containment protocol<br>• Not yet established nationwide or globally | • Containment can be carried out faster, saving both time and money, and reducing the risk of spread |
| Regular inspection<br>• Was done in 2014 in the US once, but not regularly carried out in private labs | • Identify hazards and risks more quickly<br>• Reduced chance of rule breaking |

## Costs and Benefits

The implementation of this project, with an estimated cost (see Appendix [A]) of $115 million USD in total over 25 years, has the potential to prevent a significant loss of life and health. The cost per QALY (quality-adjusted life year) saved, is anywhere from $0.95 USD to as low as $0.027 USD – remarkably low when compared to typical healthcare interventions, which often range from $50,000 to $150,000 per QALY. Even though this doesn't take into account the costs that would be incurred from implementation in other non-US countries, it can still be estimated that cost per QALY saved would not exceed $100 USD by use of Fermi estimations. This demonstrates that the project could be an exceptionally cost-effective measure for global biosecurity. Furthermore, the above cost analysis only takes into account human pathogens. The risk of a disease that could devastate animal and plants could have even more far-reaching consequences for agriculture and food security worldwide, further increasing the total QALYs potentially lost without intervention.

# Potential Flaws

| Problem | Justification |
|---|---|
| **Funding**<br>• Low willingness for countries to contribute<br>• May not be feasible for low-income countries | • Establishing one further measure for existing protocol is simply following precedent, as this has already been done before for chemical and nuclear weapons.<br>• After the recent events of the COVID-19 pandemic and lab-leak theories, countries across the world are likely willing to contribute billions more in funding for accountability.<br>  ○ Many nations have called for improvements for policies (such as the BWC) in the past few decades, and would likely comply with any monetary requirements to provide as a result.<br>  ○ "Compared to an estimated $1 trillion plus cost of a bioterror event, biodefense funding efforts |

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| | are worthwhile, both in theory and in practice”<br>● The cost of funding a task force and database maintenance is much smaller than the global economic cost another pandemic would bring.<br>● BSL-3 and BSL-4 labs aren’t usually found in developing countries, so implementing this in those nations does not need to become a financial burden for them. |
| **International Cooperation**<br>● Countries with significant geopolitical concerns or those that prioritize sovereignty over international cooperation may resist external regulation and oversight | ● Policies may apply internationally, but the proposal focuses mainly on what can be done within each country (i.e. registering private labs), rather than creating an overbearing international task force. This is so that emphasis is placed on protecting civilian health and safety. |
| **Chesterton’s Fence**: "Do not remove a fence until you know why it was put up in the first place."<br>● Current biosecurity policies and regulations may exist for reasons that aren't immediately apparent.<br>○ Project could inadvertently introduce new risks like excessive bureaucracy or overregulation<br>○ e.g. there might not be lab registrations because of factors like operational efficiency, confidentiality, or national security | ● Before implementing any new measures or changing existing ones, conduct thorough reviews to understand the reasons behind current practices<br>○ e.g. engage with experts and stakeholders to gather insights on the original purpose of existing policies<br>● Usage of pilot program with initial small-scale implementation and gathering of feedback to understand impact<br>○ Allows for adjustments before wider implementation |
| **May not target source of pathogens:** Does not address ePPPs and dual-use research technologies, which is the root of this issue | ● Might actually be more difficult to regulate the technology due to resistance from the scientific community than just enforcing stricter safety regulations that are more cost-effective |

# Conclusion

The proposed project represents a crucial step forward in addressing the growing risks posed by laboratory-based pathogens. By improving oversight and enforcing comprehensive regulations in laboratories, we can significantly mitigate the potential for lab leaks and enhance global biosecurity. The establishment of a centralised database ensures that all laboratories, regardless of their location, adhere to the highest safety standards. This proactive approach not only strengthens defences against potential pandemics but also builds greater transparency and accountability. The integration of these measures will

ultimately lead to a safer global environment, where the advancement of scientific research can continue without compromising public health and safety. Of course, it is important to note that this is not a panacea for an issue as large as biosecurity, but this could be a massive step forward in making labs safer for humanity.

## Appendix

## References