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# Biosecurity Policy Dashboard<sup>1</sup>

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## Abstract

Biosecurity policy is increasingly important to the governance of artificial intelligence, biotechnology, pandemic preparedness, and synthetic biology, but U.S. federal policy signals are spread across fragmented and difficult-to-monitor sources. Relevant developments may appear as legislation on Congress.gov, proposed or final regulatory actions in the Federal Register, or as docket materials and comments on Regulations.gov. This fragmentation creates a barrier for policymakers, researchers, advocates, and other stakeholders who need to track emerging biosecurity rules and legislative activity.

We present the Biosecurity Policy Dashboard, a proof-of-concept tool for aggregating and exploring U.S. federal biosecurity policy documents across Congress.gov, Regulations.gov, and the Federal Register. The system uses keyword-based retrieval to identify potentially relevant legislative and regulatory records, stores the results in a local SQLite database, and displays them in an interactive Streamlit dashboard. The dashboard allows users to search, filter, sort, and inspect relevant policy documents by source, date, keyword match, agency, docket, and document type.

The current prototype demonstrates the feasibility of a unified, regularly updated policy-monitoring interface for the U.S. biosecurity landscape.

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<sup>1</sup> Research conducted at the [AIxBio Hackathon](#), April 2026

## 1. Introduction

The nexus of artificial intelligence and biology is driving rapid change and has caught the attention of policymakers. The White House's 2025 AI Action Plan explicitly calls for the U.S. to invest in biosecurity, noting that while AI holds promise to advance scientific research and patient care, it also "Could create new pathways for malicious actors to synthesize harmful pathogens and other biomolecules." [1] While this acknowledgement is an important step, durable safeguards often require legislation, regulation, procurement rules, funding conditions, or agency implementation guidance. Policymaking in the U.S. is an insular process, and one in which even experienced practitioners such as one of the co-authors of this paper, find difficult to stay on top of and navigate, given the fragmented nature of public-facing policy information dissemination.

Imagine for example, a hypothetical new staff member joins Senator John Doe's office. Senator Doe is concerned about reports that AI tools are enhancing the ability of novices to create novel viruses. He tasks the staffer with keeping him up to date on the latest policy changes in AI - Bio and the larger biosecurity policy world. The staffer would need to acquaint themselves with websites such as [Congress.gov](https://www.congress.gov) [2], [Regulations.gov](https://www.regulations.gov) [3] and [FederalRegister.gov](https://www.federalregister.gov) [4]. These websites, especially the latter two, are notoriously difficult to navigate and the staffer, who likely focuses on multiple issues areas beyond biosecurity, would need to constantly perform searches of all three websites whenever his boss requires an update. This involves trying to keep a handle on bills filed in the House and Senate, by personal offices and committees, and regulations put forth by agencies ranging from the Department of Agriculture to the Departments of Labor, Health and Human Services, and even State Department, just to name a few. Even following one regulation from a single agency is difficult, given the duplicative nature of [Regulations.gov](https://www.regulations.gov) and [Federalregister.gov](https://www.federalregister.gov), the fact that many staffers have never worked at a federal agency and that regulations often take a long winding path, with procedural requirements and timelines differing based upon which agency is issuing the rule.

But it's not just congressional or federal agency staffers interested in these developments. When legislation or rulemaking starts to move, this attracts the attention of a wide variety of stakeholders and experts. A single rulemaking from a small agency often draws public comments from varied stakeholders - a biosecurity focused rule may draw comments ranging from world-class scientists, to Fortune 100 companies, to leading non-profits, to individual constituents.

Large corporations and their lobbyists are well-suited to deal with the complex process and deluge of information. They have significant resources, including lawyers and former policymakers who understand the intricacies of the process. But for the majority of stakeholders, both novices and experts alike, the process is time-consuming, inefficient, and difficult to keep up with.

Our main contributions are:

1. Integrated Biosecurity Policy Dataset — We construct a biosecurity policy relevant dataset aggregating legislative and regulatory records from [Congress.gov](https://www.congress.gov), [Regulations.gov](https://www.regulations.gov), and the Federal Register, and provide tools to update this dataset daily.
2. Interactive Dashboard — We develop a Streamlit-based interface that enables real-time exploration of biosecurity policy developments.

## 2. Related Work

Several organizations and individuals have taken important steps to provide dashboard or public repositories useful for those interested in biosecurity and AI - Bio policy.

The [Emerging Technology Observatory](#) has a tool, AGORA, that is “A living collection of AI-relevant laws, regulations, standards, and other governance documents from the U.S. and around the world.” [5]

There are other resources more narrowly focused on Biosecurity. The website [Emergingtechpolicy.org](#) [6], a project of the Horizon Institute, notes that the following tools are available:

- [US Government Biodefense Budget Breakdown](#), Council on Strategic Risks [7]
- [Map of the Biosecurity Landscape](#) [8]

Also highlighted is B-SPAN: An interactive tool mapping US [biodefense activities in the executive branch](#) and [in the legislative branch](#), Bipartisan Commission on Biodefense [9]. Importantly, this website notes that information is only accurate as of May 2024.

Our work differs in a couple of important ways. There is currently no tool available to our knowledge that provides regularly updated information encompassing the three major websites needed to track incoming legislation, federal regulations, and proposed regulations going through the byzantine rulemaking process.

Our tool provides insights for policymakers and other policy stakeholders both at a macro level and for more narrow issues. It gives a unified, regularly updated view of U.S. federal biosecurity policy activity across major legislative and regulatory sources, while also making it easier to keep up to date with narrow issues areas, specific legislation, or the rulemaking of a single agency or group of agencies.

### 3. Methods

We obtained API keys for [Congress.gov](#) [2] and [Regulations.gov](#) [3]. These API keys are free upon request. [FederalRegister.gov](#) [4] is available through a public API endpoint. [Congress.gov](#) and [Regulations.gov](#) impose API limits of 1,000 per hour.

Next, we compiled a list of keyword terms relevant to biosecurity policy. We included a broad list of terms to ensure our database would capture a wide range of applicable documents. The complete list of terms is listed in the Appendix.

A key goal of this dashboard is to provide the ability to stay up to date with the U.S. federal biosecurity policy landscape. To include recent records, we performed a series of API calls from our three data sources. We collected all Federal Register records from 2026-01-01 to present day. Partial collections of records for the 119th Congress, the Federal Register from 2016-01-01 to present day, and regulations from 2016-01-01 to present day were also collected. Only partial subsets of the 119th Congress, Federal Register and regulations records were compiled due to API rate limit restrictions. With additional time and API calls, these partial subsets could be completed.

Once this set of records was compiled, we filtered the documents using Boolean keyword searching. Any document containing any of the keyword terms in the title, abstract, or full text was retained. Retained documents were compiled into an SQLite database. Documents pertaining to the same piece of legislation or rule change, based on the document's id or title, were labeled as related items.

A Streamlit app was developed to interface with the SQLite database. The Streamlit app provides the dashboard for the user to interact with the Biosecurity policy database. The app includes a search feature to further refine the database based on keyword searching. These keywords can be distinct from the biosecurity keywords used to curate the dataset. The search feature matches documents containing the keywords in the title, abstract, or other dashboard columns. Other features of the app include date range windowing, selecting which dataset sources populate the dashboard, and modifying the sorting of the dashboard. A partially implemented feature allows the user to request a data refresh—resulting in API calls to the three data sources to populate data since the last data refresh. As the dataset is not fully populated with recent records, this feature is currently disabled.

Because the dashboard is implemented using a local SQLite database, it is not currently accessible through a web interface over the internet. The dashboard can only be accessed locally in its current implementation.

## 4. Results

Screenshots of the dashboard are included to demonstrate its functionality. The overall view of the dashboard is shown in Figure 1.

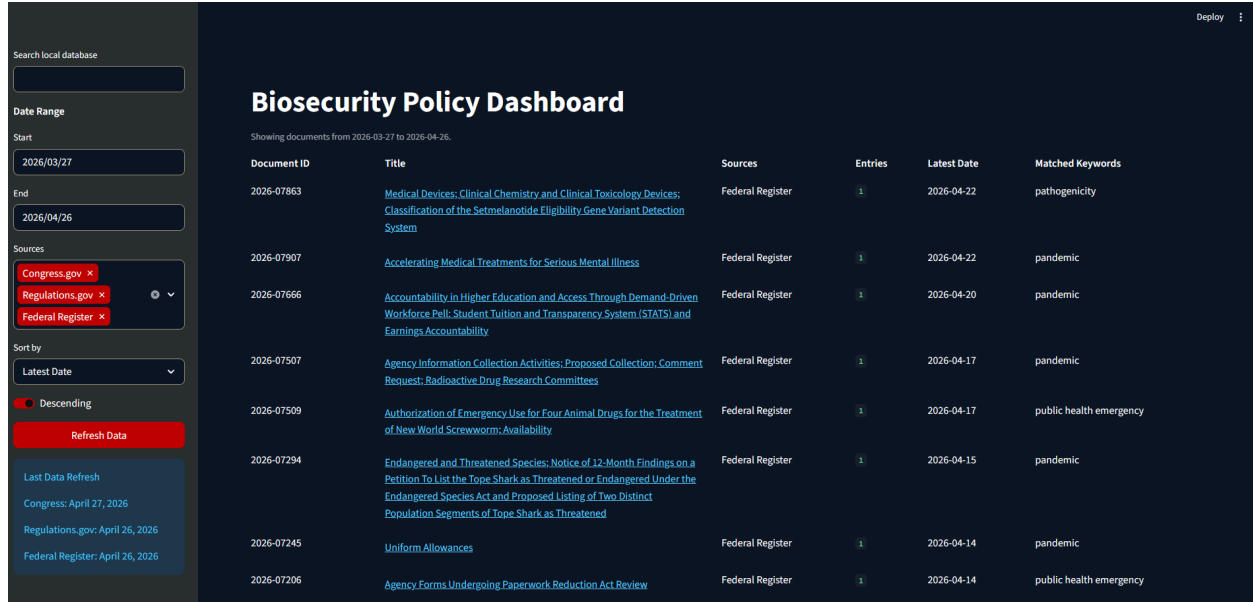


Figure 1: Biosecurity Policy Dashboard.

On the left-hand side, the keyword search, date range modifiers, source modifiers, sorting mechanisms, and information about the most recent data refreshes are presented in a collapsible menu. The central view shows the policy dashboard, sorted by most recent documents. The primary columns include the Document ID, Title, Source, Entries, Latest Date, and Matched Keywords. The Entries column displays a number, indicating the number of records associated with a row. Some documents, such as ones in the [Regulations.gov](#) docket, can have multiple versions associated with one record, like comment periods for a proposed rule change. Likewise, documents can appear in both [Regulations.gov](#) and the Federal Register. These related items are merged into one row in the dashboard and can be expanded into their constituent components upon a click.

Figure 2 demonstrates the dashboard's ability to display more detailed information about a record. The detailed information is displayed upon a click of an underlined title.



Figure 2: Detailed view of a row of the Biosecurity Policy Dashboard.

The detailed view provides additional information not visible in the complete document such as the agency, docket, document type and abstract of the entry. Not all documents have every entry. In cases in which they are missing, the associated column is left blank. Figure 3 shows an example of an abstract field.

Date	Agency	Docket	Document type	Matched keywords	Abstract
2024-10-04			Notice	nucleic acid synthesis, biosecurity, biodefense	The U.S. Artificial Intelligence Safety Institute (AISI), housed within the National Institute of Standards and Technology (NIST) at the Department of Commerce, is seeking information and insights from stakeholders on current and future practices and methodologies for the responsible development and use of chemical and biological (chem-bio) AI models. Chem-bio AI models are AI models that can aid in the analysis, prediction, or generation of novel chemical or biological sequences, structures, or functions. We encourage respondents to provide concrete examples, best practices, case studies, and actionable recommendations where possible. Responses may inform AISI's overall approach to biosecurity evaluations and mitigations.

Figure 3: Abstract field for a document.

The abstract field provides the user with a more detailed understanding of a document and helps them quickly assess whether the document is relevant or not. The full text of the document is not currently provided in the dashboard due to speed concerns.

Figure 4 demonstrates the search capability of the dashboard. Researchers can use this to limit the dashboard to entries relevant to their question at hand. In this example, the search function is used to restrict entries based on their matched keywords.

Search local database  
gain-of-function

Date Range  
Start: 2016/05/01  
End:

### Biosecurity Policy Dashboard

Showing documents from 2016-05-01 to 2026-04-26.

Document ID	Title	Sources	Entries	Latest Date	Matched Keywords
2025-15344	<a href="#">Improving Oversight of Federal Grantmaking</a>	Federal Register	1	2025-08-12	gain-of-function, pandemic

Figure 4: Search function demonstration.

## 5. Discussion and Limitations

The U.S. plays a leading role in the development of Artificial intelligence and AI-enabled biological applications. Policymaking that occurs in the U.S. thus has an outsized impact globally. Further, given factors such as America's size, geopolitical influence, and expert-involved policy process, federal legislation and standards influence policymaking worldwide.

The COVID-19 pandemic, which cost the U.S. economy trillions of dollars and over a million lives, demonstrated that biological agents, regardless of their origin, pose significant economic, public health and national security threats. But despite this recognition, policymakers face several hurdles in developing and implementing laws and regulations that can protect innovation while also safeguarding against grave risks. In addition to the complexity of technology involving AI and biology and its rapid rate of acceleration, the fragmented U.S. federal policy ecosystem is difficult to follow even for experienced and well-resourced organizations.

For individual policy staffers, as well as those at organizations such as think tanks, universities, non-profits and any others who wish to positively impact the process, a real-time comprehensive dashboard could provide a significant assist. Our tool provides a window into ongoing developments in Congress and the executive branch - few organizations can afford to have multiple lawyers, domain experts, and ex-legislative and federal agency staffers on staff to monitor developments across the breadth of the federal government. Democratizing access to this public information will allow for a more informed and robust policymaking process, allowing experts and concerned individuals from all walks of life to more robustly participate in this critical process, and in so doing, level the playing field of information that filters to policymakers, and in the capacity of policy staff themselves to perform their jobs to the best of their abilities.

We do recognize that limitation exists. Given the condensed nature of the hackathon, we chose to have a relatively narrow scope for the dashboard. An expanded dashboard could provide access to the incoming volume of research reports produced by think tanks and researchers on these topics. It could provide a daily or weekly briefing feature that highlights the three to five most important developments in the space. In addition, one assumption we made is that those following biosecurity policy would not wish to have access to too expansive a dashboard. For example, the dashboard could also include information sourced from the WHO or CDC on outbreaks, but this information is generally most important for epidemiologists, who are working to keep track of real-time updates on diseases across the globe.

The current dashboard is run locally. This is a major limitation as the purpose is to provide a publicly accessible resource that provides real-time information on the federal biosecurity policy landscape. However resolving this issue would only require migrating the SQL database to an online repository and some small adjustments to the code to instead publish the dashboard on a publicly accessible website. Finally, an additional limitation is that the current keyword search implementation returns too many irrelevant documents. A more sophisticated filtering process would ensure the document is biosecurity policy relevant rather than simply matching on keywords. To overcome this, a LLM could be used to evaluate the relevancy of a document passing the keyword filter before the document is added to the SQL database.

## **Future Work**

The natural next steps are to move the dashboard to a platform hosted online. This would include migrating the local SQLite database to an online repository. These steps should be fairly simple with additional time. Additional near-term steps include completing the historical database compilation and validating the pipeline is accurately returning all records that should be included. Long-term steps include addition of more dataset sources, such as publications relating to biosecurity policy and implementation of additional features.

## 6. Conclusion

This work develops a proof of concept for a dashboard that integrates biosecurity-relevant policy documents from multiple legislative and regulatory sources. Once deployed, the Biosecurity Policy Dashboard could reduce the time and effort required to track developments in biosecurity policy by providing a one-stop shop to view the landscape of federal biosecurity policy, while also allowing for individuals to find the exact legislative issues areas, bills, or regulations that they seek to stay abreast of.

## Code and Data

- Code repository: [https://github.com/Grant-Schumock/Biosecurity\\_Dashboard](https://github.com/Grant-Schumock/Biosecurity_Dashboard)
- Data/Datasets: The data is currently hosted locally. The GitHub page has instructions on how to replicate the dataset locally if desired.

## Author Contributions

G.S. developed the GitHub repo. A.P. drafted the report. Both authors contributed to the project idea formulation and revised the report.

## References

- [1] The White House, 2025, America's AI Action Plan, <https://www.whitehouse.gov/wp-content/uploads/2025/07/Americas-AI-Action-Plan.pdf>
- [2] Congress.gov, <https://www.congress.gov>
- [3] Regulations.gov, <https://www.regulations.gov>
- [4] Federal Register, <https://www.federalregister.gov>
- [5] Emerging Technology Observatory, AGORA, <https://agora.eto.tech/GORA>
- [6] Emerging Tech Policy Careers, <https://emergingtechpolicy.org/>
- [7] Council on Strategic Risks, Biodefense Budget Breakdown, <https://councilonstrategicrisks.org/nolan/biodefense-budget-breakdown/defense>
- [8] Biosecurityworld, Map of the Biosecurity Landscape, <https://biosecurityworld.notion.site/24326cc06be04b34a48076a260482c7b?v=1335ef216bed477f930de7c35d5a36e9>
- [10] Bipartisan Commission on Biodefense at the Atlantic Council, Helping to Defend the United States Against Biological Threats, <https://biodefensecommission.org/>

## Appendix

The list of keywords used to construct the database is:

"nucleic acid synthesis",  
"nucleic acid procurement",  
"synthetic nucleic acid",  
"sequence screening",  
"sequence-of-concern",  
"customer screening",  
"benchtop nucleic acid synthesis",  
"benchtop synthesizer",  
"dual use research of concern",  
"DURC",  
"PEPP",  
"pathogenicity",  
"gain-of-function",  
"biosecurity",  
"biosafety",  
"biodefense",  
"bio-defense",  
"bio-safety",  
"bio-terrorism",  
"biological incident",  
"bioterrorism",  
"pandemic",  
"public health emergency",  
"CBRN",  
"AlxBio"

## LLM Usage Statement

ChatGPT-5.5 was used for light editing and drafting of the abstract and conclusion.

ChatGPT-5.3 was used to generate a list of government datasets that could be useful for the dashboard. Codex with GPT-5.5 was used for drafting Python code. All text and code was reviewed and verified.