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How to avoid future ’’Covid-19 origins’’ questions?

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Summary Origins debates regarding Covid-19 are gaining momentum again. In light of the continued infections and deaths of Covid-19 seen in countries rich and poor, rather than focusing the approach with ‘‘whodunit’’, developing solutions that can help societies become better prepared for future pandemics might be a more meaningful way to move forward. In this paper, we propose a solution that could help society better predict and prevent future pandemics. A system could allow humans to anonymously report potential infectious disease outbreaks without fearing backlash or prejudice and could automatically surveil for potential disease transfers or virus leaks. The proposed autonomous and anonymous pandemic reporting and

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surveillance system has the potential to help health officials locate infectious disease outbreaks before they form into pandemics. And in turn, it better prevents future pandemics and avoids Covid-19 origins debates.

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The “whodunit” question about Covid-19 origins continues to ferment [1]. On October 13th, 2021, the World Health Organization has formed its second team to investigate the Covid-19 origins [1]. It is important to note that October, 2021 is when affluent countries like the United States still have an average of approximately 10,000 new Covid-19 cases daily [2]. In a time when low to middle-income countries, from Yemen (0.2%) to Uganda (0.9%), by mid-October of this year, many countries worldwide have less than 1% of their population vaccinated [3]. While truth matters, in light of the sobering statistics about Covid-19 and the importance of medical resources amid the pandemic [4], it is worth asking: Can Covid-19 origins investigations offer more answers than questions? (Fig. 1) What about questions addressing the topic of “How to avoid future Covid-19 origins” investigations?

Overall, three considerations are at the center stage of the Covid-19 origins discussions: (1) whether the virus was transferred from wild animals to humans, (2) whether the virus was leaked from a lab intentionally or accidentally, and (3) whether particular Chinese government or health offices hindered the disease identification or prevention process. While these questions are thought-provoking and emotionally-stimulating, it is essential to note that answering them can offer limited help to strengthen the ability of societies to prevent future pandemics. Essentially, regardless of how the Covid-19 origins debates unfold, the known facts about the pandemic are hardly refutable: it is close to impossible (1) to avoid human-animal contact, (2) to eradicate human errors, and (3) to annihilate human malice or self-interest. In other words, zoonotic infectious diseases are inevitable, and what is also inevitable are intentional or unintentional human flaws that might further worsen disease outbreaks.

Infectious diseases, especially those zoonotic in nature, could become more prevalent if unchecked human activities continue, such as enlisting animal habitats for food production [5]. With the Black Death occurring in Italy, HIV famed throughout cities across America, and the 1918–1919 influenza pandemic attributed to Spain [6], without adequate disease surveillance systems in place, countries may be forced to answer future infectious diseases origins questions and fend from blame and backlash [7,8]. Infectious diseases are unavoidable, especially those that are zoonotic in nature [9]. However, what can be controlled is how swiftly and effectively societies can accurately identify outbreaks before they form into pandemics [10]. One way for the world to better avert future pandemics is by developing a pandemic surveillance system that can bypass the need to solve impossible problems such as preventing humans from contacting wild animals or eradicating human vices or errors for good.

One noticeable potential of this system is that it could help societies detect, identify, and control infectious disease flare-ups and outbreaks in their infancy (Fig. 2). There are two possible approaches to achieve this objective: (1) anonymous human reports on potential infectious disease cases and (2) autonomous technology-based surveillance systems to monitor disease outbreaks, vetted by rigorous reviews conducted by epidemiologists anonymously. With advanced technological solutions, such as smart sensors and general artificial intelligence (AI) equipped with powerful data analytics and computing capabilities, technologists and epidemiologists could identify potential infectious disease outbreaks via genomic surveillance, real-time monitoring of sewage and air for potential virus clusters, and analyzing social media content for similar disease patterns faster and more accurate [11].

Anonymous human input is the other crucial component of the system. In addition to autonomous infectious disease outbreaks detected by functions such as AI-powered machine vision and natural language processing, the heavy technology integration can also anonymously allow active and proactive human inputs of potential disease outbreaks. The anonymity assured by the system, both at the individual reporting, system analyzing, and epidemiologists reviewing levels, could be crucial to persuade communities from all walks of life (e.g., ordinary farmers, early-career doctors, and famed scientists) to participate in the pandemic surveillance process without fearing for backlash or bullying. Anonymity should be ensured at the entire reporting mechanism, vetted technologists and epidemiologists should be selected on a rotating basis so that no one would know the true identity of the pandemic “reporters” or “reviewers”, effectively making sure these “pandemic guardians” would not be: (1) embarrassed by potential false positives, (2) retaliated by reporting true positives (e.g., actual pandemic-prone infectious disease outbreaks), and (3) discriminated against or bullied by their family, friends, colleagues, or strangers.

Further ensuring and protecting anonymity, the system could operate as an independent organization that directly reports to the head of the government, presumably the least likely person who wishes to see a pandemic ramp up a nation, effectively making the system more resistant to human errors and malice. This setting could also offer a much-needed layer of authority and assurance to safeguard further the ability to make evidence-based public
Figure 1. Questions the Covid-19 investigations cannot answer.

We named the proposed system the Anonymous and Autonomous Pandemic Surveillance System (2AP2S). A technological system could be a meaningful and fruitful contribution to the current and future pandemics, it has the potential to not only inspire current pandemic interventions to make them more solution-focused but also can nullify the need for future "Covid-19 origins" debates or probes. Acknowledging and addressing the inevitability of infectious disease outbreaks, 2AP2S has the potential to help societies capture pandemic-prone outbreaks faster, with greater precision and efficiency, and without incurring futile conflicts that could harm global solidarity for the long run.
Figure 2. The Anonymous and Autonomous Pandemic Surveillance System (ZAP2S).

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Authors’ contributions
ZS conceived the work, reviewed the literature, drafted, and edited the manuscript. DMD, AC, JA, SS, CPDV, & YTX reviewed the literature and edited the manuscript.

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The authors declare that they have no competing interest.

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