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Data with borders for a borderless virus: Insights and recommendations from the case of Lebanon

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Lebanese healthcare personnel continue fighting against coronavirus (COVID-19) pandemic at Rafic Hariri University Hospital in Beirut, Lebanon on January 12, 2021.

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One of the major lessons learned from the COVID-19 pandemic is the value of having complete, accurate, timely and accessible data for an evidence-informed national public health response. Globally, many countries have called for a **standardized reporting system**^[i] that collects, visualizes and shares timely data. To achieve this, rigorous public health surveillance systems must be built on adequate coordination between various public authorities as well as transparent public-private collaborations in an effort to facilitate the exchange of data, skills and opinions,^[ii] which are fundamental components of an evidence-informed national strategy.

In the case of Lebanon, the COVID-19 data reporting system was mired with central issues, mainly the fragmentation of the publicly available data across a multitude of official reporting sources. Additionally, the inaccessibility of the raw data by the academic community hindered the process of knowledge and skills sharing– a missed opportunity for modelling data, making data-driven predictions, and generating contextualized evidence-based recommendations. In the absence of transparent data-sharing, some researchers and the lay public quite often described the public health measures taken by the authorities (i.e. irregular lockdowns) as random, unnecessary and not evidence-informed.^[iii]

In this realm, there is a strong need for an official, unified, open data platform to support collaborative, high-quality analysis and research, ensure transparency and verifiability of reporting, and encourage data-driven solutions. It is also vital that the preparedness for and management of future epidemics, as well as ongoing health surveillance activities, involve all stakeholders including local infectious disease epidemiologists, public health professionals, and behavioural scientists who have the experience and expertise needed in a multi-stakeholder public health response strategy.

Fragmentation of the reporting system in Lebanon

In Lebanon, the official data reporting system for communicable diseases is the Epidemiological Surveillance Unit (ESU) at the Ministry of Public Health (MOPH). The first confirmed case of COVID-19 in Lebanon was reported on 21 February



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2020. The ESU initially spearheaded data reporting, releasing daily reports limited to the number of cases, deaths and recoveries, and the number of positive tests, as provided by the Rafic Hariri University Hospital (RHUH). Early on, RHUH served as the primary and only governmental centre offering free testing services.^[iv] In April 2020, the Lebanese government expanded its testing capacity adding 15 additional testing sites to RHUH. The increase in testing centres, which was a positive move to maximize the detection and isolation of confirmed cases, created a more complex mechanism of data collection and coordination.

Data reporting extended and was carried out by governmental and non-governmental bodies, including the Disaster Risk Management Unit (DRM) at the Presidency of Council of Ministers, the Ministry of Information (MOI), the Lebanese Red Cross (LRC), and the National Council for Scientific Research (CNRS), the Internal Security Forces (ISF), as well as WHO-Lebanon and UN agencies. Gradually, the data became more detailed and diverse by all reporting bodies, which (except for the UN) stated MOPH as the main source. Although each entity has a different jurisdiction, they still intersected with one another. For example, the ISF is the entity in charge of prisons; still MOPH - specifically the ESU - is the one responsible for epidemiological parameters for COVID-19. As such, MOPH reports on general parameters, while ISF specifically reports on numbers related to prisoners.^[v] Replication, while inefficient, is supposedly harmless. However, data fragmentation across different reporting sources inevitably became a source of confusion for public health professionals as well as the public. For example, initially, MOPH^[vi] focused mostly on total counts of cases, recoveries, and mortality; DRM^[vii] included statistics on the daily number of Polymerase Chain Reaction (PCR) tests and the number of cases inland versus at the airport; and WHO included data disaggregated by sex, age, and geography.

Besides fragmentation, the publication of inconsistent data on the same indicators was a bigger issue. Discrepancies in the deaths count between LRC and MOPH dashboards, and the testing count between MOPH and DRM daily reports were noted by public health professionals who were following the data.^[viii] Figures on hospital occupancy were also inconsistent, which DRM addressed publicly on Twitter^[ix] in early October 2020. Data inconsistencies have recently extended to vaccines as witnessed through the conflicting numbers of actual doses



administered by the MOPH[x], [xi], [xii] and the Inter-Municipal Platform for Assessment, Coordination & Tracking (IMPACT) platform. The latter is an initiative by the Central Inspection Board in collaboration with the private sector and international organizations to give access to open data generated on different levels of the public sector (such as municipalities and ministries) and allow citizens to have easier access to information.[xiii] This platform has engaged different actors under one umbrella, from data reporters (e.g. hospitals, MOPH), to policymakers (e.g. MOPH, MOI) to implementers (e.g. municipalities). It has allowed the crosschecking of the data in digitized form between MOPH and municipalities, therefore, minimizing errors.[xiv]

While the launching of IMPACT has provided a growing open data repository to enhance transparency, a major gap remains, which is the unavailability of a publicly available, de-identified, raw dataset for research purposes; to further complicate matters, existing databases are reportedly not linked (such as the ESU surveillance data and the IMPACT vaccination platform). Another issue is the inability to track data changes/make corrections retrospectively. For example, there was about a one-month delay in ascertaining COVID-19 as the underlying cause of death for 290 cases; consequently, they were reported late.[xv] Were these death cases ever corrected based on their actual date of death later on? Correcting these delays is essential to track the progress of the pandemic.

Besides fragmented reporting systems and data inconsistencies, another issue is the lack of clear definitions for the different classifications used. For example, the MOPH added a new category to the number of tests: “tests done at the border” in mid-November 2020. Before that, there were only two categories “tests done inland” and “tests done at the airport”. Without any explanation, reviewers of such public reports were left wondering where the “tests done at the border” were being classified earlier. Improper indicators for decision-making were also a concern, such as the use of the birthplace instead of the place of residence of positive cases to support the zoning approach that took place in September 2020. The MOPH minister did in fact state publicly that some areas were incorrectly isolated.[xvi]

Impact of data fragmentation on



management of epidemic

Issues of data reporting also raise concerns about the overall management of the epidemic in Lebanon. The most important of these is the lack of accurate estimations of population numbers; the last national census for the Lebanese population was done in 1932.^[xvii] This will mislead the assessment of the pandemic's numbers, which in turn will lead to the mismanagement of the pandemic. Open Map Lebanon^[xviii] pointed out that population numbers are overestimated, thus questioning if the risk of the pandemic was well assessed.

At the time of writing, individual-level (de-identified) data on all “official platforms” (except IMPACT¹) are not publicly accessible. Even the aggregate data and the time series of cases/deaths/hospitalizations are not available in a downloadable format for end-users to analyze/synthesize and inform policies and practices. This left independent researchers (not necessarily public health and healthcare professionals) with the need to unify the available data and create their own databases for analysis.^[xix] An open-access data platform would allow scientists and academics to invest their knowledge and critical skills in conducting meaningful analyses and mathematical modelling of the local epidemic to inform public health interventions. A unified public-access official data platform supports high-quality research, ensures accountability of public institutions, and encourages data-driven solutions. Lessons could be learned from other countries in the region, such as Qatar where the exemplary partnership between governmental bodies and academic research centres and institutions led to an informed and data-driven public health response to the epidemic, as well as generated a large body of the highest quality scientific research

Recommendations

Issues of data quality are not unique to Lebanon. Other countries including Canada,^[xx] Spain,^[xxi] among others, have also experienced data reporting issues. There are, therefore, several lessons to be learned from other settings where the urgency of this pandemic pushed governments^[xxii] (such as the Netherlands,^[xxiii] Germany,^[xxiv] and Australia^[xxv]) to openly release coherent and exhaustive daily detailed updates of COVID-19-related statistics by person,



place and time. This is in addition to ongoing retrospective corrections in machine-readable data files.

Below are the main recommendations we make based on evidence of successful stories. The mechanisms of how to ensure their successful implementation and evaluation are beyond the scope of this paper.

- 1. Strengthening political commitment:** A national response to pandemics necessitates a multi-sectoral collaboration extending beyond the health sector to include the education, industry, finance, and transportation sectors, among others. Political commitment at the highest national levels is crucial for the implementation of such a comprehensive response.^[xxvi] On the one hand, the government should be setting clear targets and indicators for the multi-sectoral implementation measures based **on real-time data** and the latest contextualized evidence generated from local analyses. On the other hand, non-compliant stakeholders (including government institutions, public institutions, and private stakeholders) should be held accountable when not abiding by the set course of action.
- 2. Fostering public, private and academic partnerships.** The insight of public health professionals/academicians and healthcare professionals from private institutions is invaluable and necessary for an adequate public health response. In a country with limited resources, this becomes imperative. In multiple countries, such as United Kingdom,^[xxvii] Qatar,^[xxviii] Colombia,^[xxix] the ministries sought out epidemiologists and public health professionals to assist in data modelling, setting up proper surveillance and tracing systems, and sharing the latest evidence on effective measures of containment. In a country with limited public resources, adopting public-private partnerships as a strategy could enhance the national response.
- 3. Centralizing data reporting.** A unified and detailed publicly accessible repository that the research community can rely on for statistical, mathematical modelling, and other analyses is key for an evidence-based national response. With the immense amount of both raw and processed COVID-19 data, there is an equal need for systems to facilitate entry, storage, access, and processing of this information. This process has been



recently called the “democratization of the data”.[xxx] There have been multiple sources on how to safely share data to inform policies and strategies.[xxxi] Such systems will minimize unnecessary duplication efforts between agencies with overlapping jurisdictions (example: MOPH, CNRS, MOIM-ISF, DRM etc.) and reduce the risk of errors. It is feasible and far more efficient than the current wasted overlap in activities. Having a system that assigns a unique ID number for each individual getting tested or hospitalized or even vaccinated can be key for efficiency and data-sharing. Critically, without such a system in place, our ability to respond effectively to inevitable future pandemics will be limited, and the cost will be human lives, long term morbidities, and economic collapse.

- 4. Digitization of data in modern times.** There is an urgent need to strengthen surveillance systems in Lebanon using available digital technologies. Digitization of data collection in the healthcare field helps ease up data inconsistencies and errors by decreasing the reliance on human resources. Recently, IMPACT has been the driving force in digitizing COVID-19 data, vaccination data as well as other demographic and socio-economic indicators. Such data-sharing efforts should prevail even after the pandemic, enhancing the cooperation between different actors and minimizing errors, duplications, and costs. Needless to mention, it should be deployed on broader aspects to include other surveillance data. Notwithstanding, such digitization of data should be coupled with data protection rules and regulations for the privacy of users’ data. Taking the example of IMPACT - and with the deficiency in data protection and digitization regulations in Lebanon - a privacy policy was published on their website detailing the terms of references, and the mechanisms to sharing the data with MOPH.[xxxii]

Moving forward, especially now that data tracking involves both COVID-19 infections and vaccinations, a more efficient system is needed. Ideally, it should be highly dependent on strong inter-sectoral collaborations, including public-private and academic partnerships, to ensure solid local research and accountability to the policy and decision-making debate.[xxxiii],[xxxiv]

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Endnotes

1. IMPACT provides the option to download the data, yet this is crude data, related specifically to the figure/table presented in the dashboard.



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