

The Testing Database as Pandemic Technology

Reflections on the COVID-19 Response in India

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Received: 7 July 2020; Accepted: 22 July 2021; Published: 3 November 2021

Abstract

This article examines the COVID-19 response in India, viewing it as deeply enmeshed in the dynamics of the ‘database’ as an emerging technology of governmentality. Databases aim to translate entire populations into units of information abstracted from social identities and local specificities. In the context of the coronavirus pandemic, bureaucratic state systems attempt to manage and respond to the health crisis via databases collating testing data across the country. Problematizing COVID-19 testing databases, we delve into the logic of database governance. We find that as a tool of governance the database falters in its attempts to compress complex identities and locations into de-contextualised units of information. As the complexity of lived reality interrupts the logic of databasing, state discourse on ‘unintended consequences’, ‘leakages’, ‘duplication’, and ‘reconciliation’ processes in the management of databases abounds and the ambivalence of databases becomes manifest in the COVID-19 response. In this article, we use secondary data to understand how testing databases intervene and interact with complex realities to establish bureaucratic order around a pandemic. We posit that COVID-19 testing databases should be understood as being embedded in emerging database governmentalities that supplant care of the population with the maintenance of databases.

Keywords

Data trouble, Databases, Governmentality, Provincialisation.

Introduction

The global COVID-19 pandemic has led to an avalanche of numbers on news portals, social media, and data-tracker websites providing real-time updates on numbers of positive test cases. At the same time, nation states, local governments, and health officials cite ratios, averages, percentage rates, and mathematical models as discursive techniques of ‘normalising’ and ‘rationalising’ disease (Foucault 1978, 91). Such statistical discourses seek to explain the present, as well as pre-empt the future, COVID-19 crisis.

To what extent COVID-19 statistics and databases enable a ‘security apparatus’, however, is a matter of debate. A security apparatus, as a tool of biopolitical governance, is concerned with the empirical object ‘population’ and the regulation of external events—such as food scarcity, market risk, or, as in our case, a pandemic—that affect the ‘population’ (Foucault 1978, 20). Despite the proliferation of statistical discourses on case–fatality ratios, infection rates, and ‘peak’ moments plotted on disease curves, COVID-19 testing data across countries is fraught with problems and has been criticised for misrepresenting the true scale of infection. Biopolitical governance depends on making the ‘population’ knowable and manageable by measuring and analysing its behavioural characteristics. As data problems engender confusion and uncertainty around infection and its impact on society, social scientists argue that how the COVID-19 pandemic is being managed throughout the world represents a shift in biopolitical governmentality (Clover 2020; Smith 2020).

In India, testing data is collated at the national level by the foremost medical research body in the country, the Indian Council of Medical Research (ICMR); however, it is managed federally, at the level of districts and corresponding states. Data transparency has emerged as a crucial component of administrative, and therefore political, competence, as signified in state-specific health bulletins. As such, data on testing, infection rates, and death counts has gained significant political value in the context of local state governance. Nevertheless, COVID-19 testing strategies have become mired in controversies surrounding the deliberate downplaying of the extent of disease. A multiplicity of data narratives from various sources has led to widespread media speculation, confusion, and criticism.

In this article, we argue that COVID-19 pandemic management in India can be read as an extension of database governmentalities. Database governmentality entails the bureaucratic processing of material—biographical and biological referents—to generate de-duplicated, de-materialised, and de-politicised data on citizen-beneficiaries; recurring data problems that emerge through interactions between multiple databases; and the constant tending of databases through maintenance, de-duplication, and reconciliation processes (Cohen 2015).

Historically, nation-state governments have sought to conceptualise and ‘enact’ a collective through data-gathering infrastructures, such as the population census and caste enumeration (Appadurai 1996; Cohn 1987). Thus, datafication is nothing new, and data problems may well be an inevitable outcome of any databasing or enumeration project. Biopolitical governmentality, as originally formulated by Foucault (1978), is concerned with the regulation and conduct of a population as an empirical referent, through the production of enormous amounts of knowledge/data about it. Database governmentality, however, refers to the displacement of the ‘population’ as the locus of biopolitical intervention. Databases entail a reimagining of ‘population’ and ‘nation’ as ‘a widely available sense of collectives and their government as not only *dependent* on an immensity of information (the familiar ground of a biopolitics), but ontologically *constituted as* information’ (Cohen 2015, original emphasis). Database governmentality thus entails the translation, storage, and interaction of persons reconstituted as data and information across a multiplicity of databases.

The origins of database governmentality in India can be traced back to the country’s national biometric database project, Aadhaar, which began to take shape in 2009 with the constitution of the Unique Identification Authority of India (UIDAI)—the statutory organisation established to plan and implement the project (Government of India Planning Commission 2009). India’s imperative for a national biometric database coalesced around a discourse on ‘duplicity’—the idea that existing identification databases (e.g., voter registration databases, driving licence databases) are plagued by ‘duplicates’, ‘fakes’, and ‘ghosts’. When individuals enrol in Aadhaar they receive a unique, biometric ID. They can then link this ID to other forms of ID that they hold, such as voter cards, food welfare cards, driver’s licences, and pension accounts, thereby ensuring their de-duplication across multiple databases. This idea of a database of de-duplicated records lies in a faith in the purity of a biometrically produced number. As primary units of a totalising information infrastructure, these ‘intelligent little stripes’, it was hoped, would unfetter economic growth, smoothen welfare outreach, and revolutionise governance (Nilekani 2009).

From its very outset, Aadhaar was imagined as a *federated system* that would allow biometric data to travel across multiple databases. Separate ministries and governing bodies each preside over databases that could be linked to Aadhaar biometrics—for example, the Ministry of Consumer Affairs, Food and Public Distribution controls the public food distribution database (PDS), while the Election Commission manages the electoral rolls. Each of these databases contains only information relevant to how it is used. Thus, the PDS database holds only personal data and biometrics pertinent to food distribution; it would not contain, say, an individual’s voting constituency or bank account information.

In the context of Aadhaar and Aadhaar-linked databases, Ranjit Singh refers to the processes of biometric enrolment, the seeding of biometric data across multiple databases, and biometric authentication as database capacities for ‘translating’ complex realities into abstract categories and scaling up these translations for macro-level consequences (Singh 2019): in other words, the transformation of society according to the conditions necessitated by databases. As Singh notes: ‘It is only under conditions of its infrastructural set-up that Aadhaar can maintain its fragile efficacy in ensuring one-to-one correspondence between a number and an enrollee: *if this means transforming a nation-state into a vast database, then do it*’ (Singh 2019, 17, original emphasis). However, the notion of a nation-as-a-database prioritises bodies that translate effectively into data: individuals who can successfully authenticate themselves through a one-to-one correspondence between biometrics and identity; and data that can be mapped across multiple databases in a de-duplicated manner. For many people it is not possible to meet these conditions and thus to successfully translate themselves into data. As a result, there are bound to be losses in translations, as bodies and biographies are rejected by databasing processes.

In the process of transforming a nation into a database, data problems emerge: first, in the translation of bodies into data; and secondly, in the interaction of data across multiple databases. Literature on the Aadhaar biometric database has been influential in highlighting the changing relationship between body and technology, and in particular the production of biometric marginality, as bodies and machines do not perfectly align for successful database encounters (Abraham 2018; Rao 2013). The federated nature of the Aadhaar database requires that people’s data must travel, in a timely manner, to other databases; failure to do so often leads to identity deletions and welfare denials (Khera 2017). As the Aadhaar project moved from the enrolment of people to being used by ministries and other bodies, many data problems arose, particularly in the seeding of data across multiple databases. Food ration beneficiaries were deleted from public distribution system databases, pensioners were removed from pension schemes, and voters were removed from electoral lists, all because they had failed to link their Aadhaar data with their ration cards, pension accounts, or voter IDs (Malhotra and Somanchi 2018; Kodali 2019; Purohit 2019).

In this article, we examine COVID-19 testing and data problems through the lens of database governmentality. Testing is an attempt to intervene in the social world of the pandemic and to extract or translate numerical narratives on the spread of infection. The process of testing itself produces data problems that affect pandemic knowledge and responses. The testing apparatus involved includes not just the

testing kits themselves but also supply chains, administrative regulations, patient bodies, laboratory work, and administrative reporting: regulations determine who gets tested, bodies must be made available for testing, and labs are crucial as thresholds where bodily substance gets translated into barcodes and statistics that thereafter travel across different databases.

In India, the COVID-19 crisis is being managed at the level of its 35 states and union territories, with local state governments at the forefront of the pandemic response. Overlaying them, multiple national governing bodies deliberate on matters of testing. These include the central Ministry of Health and Family Welfare (MoHFW); the Indian Council of Medical Research (ICMR), the leading regulatory body, responsible for standardising test kits, test protocols, referral forms, and data reporting; and the Home Ministry, which is in charge of the domestic police personnel involved in contact-tracing duties. To further complicate the situation, health is managed federally, at the level of states. At this level, state health departments, urban municipalities, and rural panchayats have been at the forefront of COVID-19 control measures.

In terms of testing data, this is collated nationally by the ICMR and the MoHFW, but is managed federally, at the level of districts and corresponding states. From the onset of the pandemic, laboratories were sending testing data separately to city, state, ICMR, and MoHFW databases. This often led to duplicate entries being made. Furthermore, in the absence of a standardised format for recording patient data at the point of sample collection, the test reports published by the laboratories contained multiple data discrepancies. As testing volumes rose, the need for uniform test results became more acute. Consequently, in April 2020, the ICMR launched its RT-PCR (reverse transcription-polymerase chain reaction) mobile app as a solution to these problems (Kaul 2020).

Developed by the National Informatics Centre (NIC),¹ a department of the Ministry of Electronics and Information Technology, the RT-PCR app is a handheld tool for use by medical staff working in the country's sample collection centres (Srivastava et al. 2020). Since the app's rollout, all sample collectors are required to input data in a standardised format, via an ICMR-mandated, sample specimen referral form, at each point of sample collection (National Health Mission Himachal Pradesh 2020). In this way, data pertinent to each patient—name, address, valid ID—should now reach all existing databases in real-time, with minimal gaps and errors. By facilitating one-time entry of data that can be integrated across multiple databases, the app is also designed to prevent entry duplication (Kaul 2020). Additionally, because the RT-PCR app is linked to the ICMR portal, all authorised

1 The NIC provides information and communication technology (ICT) across various arms of the government and has been involved in developing digital goods such as public health surveillance applications.

testing laboratories are now able to enter final test results on the specimen referral forms generated for each sample (Srivastava et al. 2020). The ICMR collates these final test results and uses them to provide cumulative estimates of COVID-19 incidence for each state. Individual states and cities also receive data through this portal, which they then aggregate and input into state-level and city-level databases.

In spite of all this, COVID-19 testing data in India remains plagued by problems that prevent it from establishing a coherent narrative on the spread of the disease and corresponding deaths in the country. A daily report is produced centrally at the national level and each state puts out its own datasheet, all of which display varying levels of transparency in terms of the number of samples processed and the number of people found to have tested positive. At the beginning of the pandemic response, the MoHFW and the ICMR had been releasing national data separately on the number of people testing positive. Often their figures were contradictory. According to officials at the Ministry of Health, this was because the process of having to disaggregate district-level data to produce figures for each state created an ‘occasional lag’ between MoHFW and ICMR data (Koshy 2020). Towards the end of April 2020, the ICMR stopped publishing data on the number of persons testing positive while the MoHFW website reported that its ‘figures are being reconciled with the ICMR’.

Since then, the ICMR has been publishing data on the number of samples tested only. Moreover, there is increasing discrepancy between official data narratives at city, state, and central-government level. Data problems include the ‘duplication’ of testing data across multiple databases; the ‘unassignment’ of positive tests to a location when states are unable to determine where the disease has been contracted; and the ‘abandonment’ of testing data that cannot be integrated into any database. The seemingly chaotic state of testing data in India would appear to give credence to Ian Hacking’s argument that ‘[t]he fetishistic collection of overt statistical data about population has as its motto “information and control” but it would more truly be “disinformation and mismanagement”’ (Hacking 1982, 283).

In what follows, we attempt to think through these *data troubles* in order to highlight the implications of database governmentality for public health in India. Applying the conceptual framework of database governmentality, our analysis of COVID-19 testing databases adds to the criticism of databases as ‘containers’ of populations and helps us to understand how the concept of nation-as-a-database undermines the welfare of populations. We argue that duplication, errors, and deletions signify problems of translation that fracture the process of transforming lived reality into the numerical abstraction desired for interaction across multiple databases.

Moreover, we maintain that emerging problems around the discrepancy of data between various levels of reporting—city lists, state databases, the government’s leading medical research body—indicate that COVID-19 databasing must be understood as *provincialised* across the federation of states and bureaucracy in the country. Indeed, the provincialised nature of databases is a significant feature of our conceptualisation of database governmentality. In arguing for provincialised databasing, we prompt a shift away from centralised databasing projects and overarching authorities to focus on the regional configuration of decentralised administrative decisions, infrastructure challenges, pathways of data flows, and data entry work that affect pandemic control. In referring to the Aadhaar biometric database as an initiation into database governmentality, we highlight the federated nature of the Aadhaar database and the data problems that arise in the interactions between multiple databases. While the UIDAI is the governing authority responsible for generating biometrics, how the biometric data of citizens is mapped across multiple identity databases depends on the political imperatives of individual states. Failures and deletions on Aadhaar are a function of multiple elements, including state-level initiatives for seeding Aadhaar data across existing voter ID and food beneficiary databases, internet network connectivity in a given region, and the quality of biometric machines at the various access points. Data problems are often localised and arise in the interaction between multiple databases across different administrative levels. Similarly, in the context of COVID-19, public health as a subject of governance is managed federally by state, city, and district authorities. Data problems, as they emerge across the various levels of reporting—city lists, hospital dashboards, municipality reports, and state and national databases—indicate that COVID-19 data problems remain provincialised across the federation of states and domains of bureaucracy in the country.

In this article we examine secondary data on COVID-19 testing problems collated from March 2020 to January 2021. We compiled our data through web searches of newspaper articles, blog posts, Twitter feeds, and YouTube videos. We used keywords such as ‘COVID-19 testing’, ‘duplication’, and ‘testing delays’, and focused on metropolitan urban cities. We also analysed High Court orders pertaining to testing problems across multiple states including Delhi, Karnataka, and Gujarat. In addition, we incorporated insights from online data-trackers, particularly data published by Global Change Data Lab, a non-profit project in collaboration with the Oxford Martin Programme on Global Development.

Our reliance on secondary data prevents us from giving a conclusive account of how patient lives have been affected by technologies of pandemic control. Instead, we have followed reported events of error and duplication in order to reveal the fractures of databases as they leak. We thus attempt an ‘infrastructural inversion’

(Bowker and Star 1999, 34) to understand the interaction of regulations, testing apparatus, and biographies in databases through the constraints and barriers in accessing healthcare that they create. As this article is written in the midst of a pandemic, we are embroiled in the political and material conditions of the very databases we attempt to critique, and this reflexive position further informs our analysis.

Case study: COVID-19 testing and databasing in India

COVID-19 tests are important for gauging the burden as well as the spread of infection, both of which in turn influence public health decisions on isolation, quarantine, containment zones, and hospital infrastructure. Testing is a social and political process involving regulations, technologies, and infected bodies; and it is a complicated administrative process, requiring a comprehensive testing protocol, sample collection, lab testing, daily reports, and regular contact tracing. Thus, in analysing COVID-19 testing in India we refer to the testing apparatus as consisting of administrative regulations, testing forms, databases, and test kits.

Testing at the beginning of the pandemic in India, as in many countries, was hampered by shortages of test kits. However, even after the country acquired these kits, many turned out to be of poor quality, producing inconclusive and faulty results (Bansal, Sethi, and Henry 2020). Even as the country went into early-stage lockdown with 500 reported cases, the numbers of tests carried out remained low (Jha and Mullick 2020)—up to 13 May 2020, the testing rate was just 1.3 per 1,000 population (Padma 2020). One reason for this low rate may have been that the country's testing infrastructures were initially reliant on imported RT-PCR (reverse transcription-polymerase chain reaction) kits; it was not until well into the first wave of the pandemic in India that the country was able to develop and deploy its own kits. By late December the number of tests conducted had increased, pushing up the testing rate to around 121 per 1,000 by the end of 2020 (Our World in Data 2020).

Test kits are 'technologies of certainty', expected to produce knowledge about the pandemic, facilitate strategies, and build trust between the public and the government (Street and Kelly 2020). They are, however, 'imbricated' in a network of heterogeneous elements that are constantly in flux (Lampland and Star 2009). The concept of 'imbrication' refers to an 'evocative picture of uncemented things producing a larger whole' (Lampland and Star 2009, 20). In pandemic management, the apparatus of testing should stimulate a productive imbrication of kits, bodies, and regulations in order to facilitate a satisfactory pandemic response. However, testing technologies come into contact with databases, giving rise to data problems that hamper pandemic management. In the context of classification

systems, Star and Bowker (1999) note that ‘the time of the body and of [its] multiple identities cannot be aligned with the ‘time’ of the classification system’ (1999, 140). Test databases, as we shall see, are unable to align with the rapidly evolving pandemic. Lives caught in the interstices of immutable systems are ‘torqued’ and twisted as biographies and classifications pull against each other (Star and Bowker 1999). By creating barriers to testing, misrepresenting deaths, and abandoning testing data, databases result in the ‘torqued’ experiences of people living through a pandemic.

Governing pandemic realities through databases

As mentioned above, in April 2020 the Indian Council of Medical Research (ICMR) launched an RT-PCR app for streamlining the collection and reporting of test data. The app would achieve this by generating an ICMR Specimen Referral Form (SRF) for each test sample, thereby enabling a seamless flow of standardised data from the point at which the sample is taken all the way to the testing labs. The app was also linked to the portal of the ICMR, for collating countrywide testing data.

However, as centralised databases and standardised forms for COVID-19 cases gained currency, problems soon became apparent. To illustrate these, we refer here to the ICMR specimen referral form ‘V9’. At the start of the pandemic, this form was used to record only those who had come into direct contact with COVID-19 patients and were therefore eligible to receive a COVID-19 test (Sharma 2020a). The initial form contained eight categories into which people could be classified. These categories were aligned with the bureaucratic logic of restrictive testing and an official government discourse that did not recognise community transmission in the country. They were as follows: symptomatic contact with a lab-confirmed case; symptomatic healthcare worker; hospitalised cases of Severe Acute Respiratory Illness (SARI); asymptomatic healthcare workers in contact with a confirmed case; symptomatic international traveller; hospitalised, Severe Acute Respiratory Illness (SARI) patient; asymptomatic, direct and high-risk contact of lab-confirmed case; and symptomatic influenza-like illness patient in hospital/(geographical) cluster.

In spite of its restrictive criteria, the V9 form also included an additional category, ‘other’, to identify individuals who were eligible to be tested but did not fit into any of the above-mentioned categories. However, there were no specific guidelines on who exactly should be considered eligible. As a result, hospitals across the country proceeded to make use of the clause to allow them to test all patients coming in for operative and post-operative procedures, in order to prevent accidental cross-infections. Even routine day-care patients admitted for chemotherapy, dialysis, and blood transfusion sessions were marked as ‘other’ and required to undergo COVID-19 tests (Sharma 2020a). In response to these practices, the health secretary at the Ministry of Health and Family Welfare (MoHFW) issued written

directives to the chief secretaries of states insisting that hospitals, and private healthcare facilities in particular, adhere to the ICMR's restrictive guidelines and refrain from demanding COVID-19 test results for patients coming in for routine procedures. This, the Ministry insisted, was to ensure that no untested patients would be denied critical care (Sharma 2020b).

Classifications, standards, and categories are crucial for organising complexity. To what extent classifications can intervene in the complexity of realities is of critical importance, particularly in the context of a pandemic. Classifications, as Star and Bowker (1999) argue in their influential book *Sorting Things Out: Classification and its Consequences*, are 'negotiated orders' incorporating values, policies, and social and political considerations as they become embedded in information infrastructures (Bowker and Star 1999). These authors note that classifications are intended to set the maximum level of granularity desirable for a classificatory system, taking into consideration the practicalities of data collection and the quality of the data. Standards, forms, and classificatory schemes, particularly those pertaining to disease, must incorporate negotiations and flexibilities and change over time in order to be effective instruments for rendering care. Ambiguously defined categories such as 'other' or 'undefined' are often used to contain multiplicities and temporalities of disease that may not be possible to capture through precise classifications (Bowker and Star 1999).

However, when classificatory logics and databasing logics interact with each other, databases emerge as less mutable than classifications. One illustration of such a glitch in the RT-PCR linked database is the following story of a doctor, who noted that once V9 forms for patients recorded under the 'other' category were uploaded onto the RT-PCR database servers, the app would not allow them to receive a re-test if they went on to develop COVID-19 symptoms (Satwik 2020). Nor would it allow them to be reassigned to any of the eight COVID-19 contact categories. Moreover, because the V9 form remained synced with their Aadhaar details, i.e., their unique biometric identification number, the app would also not allow 'other' patients to re-register themselves in order to get access to a test. In sum, the restrictive testing strategy built into the RT-PCR app interface disallowed re-tests for any patients other than those primarily identified as COVID-19 contact cases. In this way, the testing apparatus was unable to capture the complex realities of how hospitals were using the V9's 'other' clause to prevent cross-infection among people accessing medical care.

The flexibility of classificatory regimes and testing strategies, as they are incorporated in written form (SRF forms, government notifications), cannot be encompassed by databases—at least not without actively and consistently engineering new affordances. In a rapidly evolving pandemic, databases can thus

offer only partial translations, thereby weakening pandemic responses. At the beginning of the pandemic, the RT-PCR app was programmed to generate specimen referral forms for RT-PCR tests only. As the pandemic progressed, Rapid Antigen Tests came to be used widely. However, the RT-PCR app could not differentiate between these two tests, generating the same, single specimen referral form for both. As a result, databases deriving data from the RT-PCR app often mixed up test results. Patients testing negative with the Rapid Antigen Test were being informed that they had tested negative for RT-PCR, even before their samples reached testing laboratories (Prakash 2020). It was not until September 2020 that the RT-PCR app was updated to incorporate the two types of tests, allowing databases to disaggregate this data (National Informatics Centre 2020).

The lack of disaggregated data until late 2020 meant that these databases failed as information and classification infrastructure. As the pandemic has continued, there have continued to be discrepancies in the data produced as a result of the different methods of testing being used in each state. While RT-PCR tests provide the most conclusive results, states have also introduced Rapid Antigen Tests, Antibody Tests, TrueNat, and CBNAAT (tuberculosis tests) (Sharma 2020; Mehrotra 2020a). The ICMR has been collating data for the cumulative number of tests only, irrespective of the method used, as well as the number of tests conducted in every 24-hour period across the different states. In a report tracking positive test rates across the states, researchers at the Centre for Policy Research argued that with no breakdown on the kind of tests being used, the results on positive test rates across the country are misleading (Mukhopadhyay 2020). These inter-state discrepancies in testing and reporting affect databasing at the central level, often rendering cumulative data incomprehensible or inadequate for finer analysis.

To what extent testing classifications and databasing have contributed to people's suffering during the pandemic is a matter of debate. What is evident is that classifying, triaging, and disaggregating those being tested as units of information orbiting various databases affects their private lives. The precise categories of data preferred for input into databases take precedence over and above timely access to healthcare. Maharashtra's neighbouring state, Gujarat, for instance, made the prior approval of government agents such as the Chief District Health Officer mandatory for asymptomatic health workers seeking an RT-PCR COVID-19 test—even for those who worked in disease hotspots—to discourage requests for regular screening among health workers. This government order was subsequently contested in court (Press Trust of India 2020). Moreover, even when individuals are tested and their test data gets translated into databases, this does not necessarily result in them getting access to care. On 13 June 2020, the BrihanMumbai Municipal Corporation (BMC) issued a circular directing

laboratories to withhold test results from patients, even as it shared the results with the ICMR database (The Times of India 2020). This order was subsequently overturned by the Supreme Court of India. However, a few days later the Directorate of Health and Family Welfare of Karnataka, a state in the southern part of India, announced similar guidelines (Arora and Swaminathan 2020). These guidelines draw on the administrative dilemma that increasing numbers of patients with ‘mild symptoms’ may unnecessarily overburden the health infrastructure. Thus, local administrations withhold test results in a bid to triage patients and control their influx into overburdened hospitals, even as their data is fed into databases. Managing disease as merely bureaucratically classified abstract numbers incorporated into live databases negates the experiential, social, and biographical aspects of disease and death. Imagining the nation as a database reduces identities and biographies to data orbiting various archives.

Data discrepancy is also prevalent in COVID-19 death counts. In some states of India, such as West Bengal and Maharashtra, death audit committees were set up to verify whether deaths had occurred due to SARS-CoV-2 infection or to complications arising from individuals’ pre-existing comorbidities (The Hindu 2020). Based on the verifications of these death audit committees, deceased patients were then assigned to various mortality lists. Deaths that could possibly be attributed to co-morbidities were not incorporated into daily estimates of COVID-19 deaths. The inevitable delay caused by the verification process—the death audit committees had to grapple with missing case details as well as errors in how deaths were categorised as per the International Classification of Diseases—meant that when numbers were finally released the death toll increased abruptly on a single day, pushing up case–fatality ratios and mortality percentages. In June 2020, for instance, the reconciliation of death data made the state of Maharashtra the locus of 50% of all COVID-19 deaths in the country (Thakur 2020). Consequently, the Maharashtra state health secretary introduced a new standard operating procedure, according to which his department would give weekly updates on the status of infected persons so that missing details could be resolved quickly (Jain and Debroy 2020).

Databases are ‘situated translations’, incorporating or abandoning individuals according to their capacity or eligibility to transform and interact as uniform data (Singh 2019). In the context of the COVID-19 pandemic, eligibility criteria for tests, death classifications, and data discrepancies interact with databases to create multiple complexities in pandemic management. Individuals thus experience ‘torque’² as they become ensnared in restrictive test criteria, administrative decisions, and immutable databases (Star and Bowker 1999). Moreover, the

2 Described by Star and Bowker (1999, 190) as when ‘the “time” of the body and of [its] multiple identities cannot be aligned with the “time” of the classification system’.

databases themselves fail as an information and classification infrastructure. For a testing apparatus directly informing pandemic strategies, the data problems it has fostered have had a significant impact on how COVID-19 has been managed. As India grapples with a devastating second wave in 2021, the under-reporting of 'hidden infections' and deaths has been highlighted as a major cause of failed forecasting and the inadequate preparation of the health system (Mukherjee et al. 2021).

Provincialised databasing: Mumbai and Delhi

State-level differences in testing strategies, data duplication, and systems of governance influence database governmentality in a pandemic. Here, we focus specifically on the provincialised nature of databases in the context of local state governance and decentralised bureaucratic settings. The concept of provincialising is a compelling contribution of post-colonial theory. Dipesh Chakrabarty, in his paradigmatic work *Provincializing Europe*, argues that universalist or centralising ideas must be provincialised, as they become 'translated and configured' through concepts, categories, institutions, and practices that are situated in a particular place (Chakrabarty 2000, 114). In our exploration of database governmentality, we argue for the provincialisation of databases, away from centralised socio-technical networks and institutions, to focus on data problems and databasing as they are embedded in local governance.

Post-colonial India is a republic of states drawn from erstwhile provinces, princely states, and territories previously administered by British colonisers (Devulapalli, 2019). In the post-independence period, the current states were created on the basis of linguistic reorganisation (Graziosi 2017–18; Singh 2008). Since Indian independence in 1947, however, there have been demands for new state territories to be carved along ethnic, cultural, and developmental differences (Rai 2012). States in India have their own governments, often headed by rival political parties, causing friction between states and the union government. The spirit of federalism enshrined in the Indian constitution enables the separation of powers between states and central government. This political regionalisation allows each state government to deliberate and arbitrate on various state subjects, such as health and education (Tillin 2021). While a centralised database system is necessary, particularly during a pandemic, political considerations at the state level tangibly influence databasing and testing strategies.

By way of illustration, in this section we look at two cities: Delhi and Mumbai. Delhi is the capital of India, designated as a union territory; Mumbai, located in the state of Maharashtra, is the financial capital of the country. These two states have had the highest number of coronavirus cases in the country, while also having different

rates of testing. To understand their specific COVID-19 data problems and the peculiarity of provincial health databases, it is important to set our observations on Delhi and Mumbai in the context of their existing governance and political histories.

Delhi transitioned from a union territory to a partial state under the 1991 Government of National Capital Territory of Delhi Act. At present, it is governed by multiple authorities: the Delhi state government; the Lieutenant Governor, who is a representative of the central government; municipal corporations; and development authorities. Health being a state subject, it also has a health minister. However, as mentioned above, in the pandemic situation health governance comes under the purview of both state and central authorities. This administrative set-up resulted in policy confusion in Delhi, with different state and central authorities deliberating on testing strategies. In June 2020, the Delhi government's health department issued a directive on COVID-19 testing strategy barring COVID-19 tests for all asymptomatic patients (Office of the Director General of Health Services 2020). Delhi's chief minister publicly stated that testing asymptomatic patients may cause the health system to collapse (Saxena 2020). However, Delhi's Lieutenant Governor overturned this decision and directed the Delhi government to test the asymptomatic contacts of COVID-19 positive patients, as per the Indian Council of Medical Research (ICMR) guidelines (Barman 2020).

Mumbai is part of Maharashtra, one of the largest states in the country. While the federal government of Maharashtra oversees public health across the state, the BrihanMumbai Municipal Corporation (BMC) is responsible for the civic and infrastructure needs of the city of Mumbai. All the executive decisions and policies of the BMC are handled by a municipal commissioner, who is an Indian Administrative Service (IAS) officer and senior civil servant appointed by the state. Maharashtra emerged as one of the states worst hit by the pandemic, with cases rising daily by over twenty thousand in September 2020. By 29 December it had tested about 1.3 crore (13 million) people, recording a positive test rate of nearly 16%. The state of Maharashtra has 207 testing laboratories, of which 94 are government labs and 113 are private (ICMR 2021). The government issued strict guidelines for private testing and introduced price caps—it initially fixed a price cap of 2,200 rupees (US\$30) for private testing but later reduced this to 980 rupees (US\$13) (Express Web Desk 2020). However, testing also became a matter of political contestation in the state, with the local political opposition accusing the state of not testing enough. Specifically, the opposition alleged that despite having a testing capacity of 38,000 samples per day, the state was conducting only 14,000 daily tests (Sarkar 2020). It was doing this, the opposition claimed, to avoid having to publicise the actual level of SARS-CoV-2 transmission in the state.

On 13 March 2020, in response to the pandemic, the state government of Maharashtra invoked the Epidemic Diseases Act 1897 (Kulkarni 2020). Most measures under the Act were carried out as part of the government's health system preparedness and COVID-19 monitoring. During the pandemic, Maharashtra went on to impose section 144 of the India Penal Code, a law that mandates curfew, in several districts of the state (A. Deshpande 2020). The state also closed down offices, schools, and other establishments in cognisance of the lockdown imposed by the central government. It also roped in the private sector to help it deal with the public health emergency. This became apparent when its state government procured 80% of private hospitals beds and levied cost caps for COVID-19 treatment (Saxena 2020). This was even more significant because being a leading metropolitan city, the type of location populated by India's wealthier citizens, Mumbai has a large number of patients who use the private healthcare sector—that said, this reliance on the private sector is perhaps an indication of the failure of the government to provide a robust public health infrastructure (Asthana and Bisht 2020).

For its part, Delhi had one of the highest testing rates in the country, with over 0.4 million (four lacs) people tested per million (ten lacs). An urban area with a higher population density than that of most other states in India, it experienced the fastest growing cluster of outbreaks in the country in June 2020 (Gupta 2020). By the end of that month, it had overtaken Mumbai to become the city with the largest number of coronavirus cases, contributing nearly 4,000 cases per day to the national tally (Jha 2020). A second and a third wave of COVID-19 cases hit Delhi in September and November, respectively, when cases exceeded 8,000 per day. The city has 92 labs that test for coronavirus, 29 of which are government-run and 63 of which are private. Emulating the South Korean model, Delhi also offered drive-through testing facilities for suspected cases with mild or moderate symptoms (Live Mint 2020). By 29 December, it had tested nearly 8.5 million (85 lacs) patients.

Both Delhi and Mumbai have been grappling with difficulties in their databasing. As databases are created at multiple administrative levels, data problems emerge. City-level COVID-19 databases have been collecting, sharing, and collating real-time data across various labs. These labs have in turn had to report data to multiple authorities, even after the RT-PCR app supposedly introduced one-time data entry through the ICMR portal. In Delhi, a writ petition³ was subsequently filed as its private laboratories sought judicial recourse on problems to do with testing strategies, sample collection, the availability of test kits, testing locations, and the

3 Writ petitions are a judicial mechanism intended to provide constitutional remedies and uphold the fundamental rights of Indian citizens. A writ petition filed by advocate Rakesh Malhotra has been pivotal in securing Delhi High Court directives issued to the Government of National Capital Territory of Delhi on matters of testing and the allocation of resources throughout the pandemic.

black marketeering of COVID-19 resources. In one of its court orders, Delhi High Court noted that

One of the prominent issues that have been flagged by the private laboratories is that they are being made to undertake a cumbersome process of contemporaneously uploading patient registration forms on the RT-PCR App, the COVID App, the ICMR Portal and the Integrated Disease Surveillance Portal linked to the office of Chief Minister, Delhi Government. They have stated that all this requires engaging several Data Entry operators so that the information can be provided to multiple government agencies on a daily basis, thereby wasting valuable time and diverting their energies from the testing process (*Rakesh Malhotra v Government of National Capital Territory of Delhi* 2020).⁴

The court order further suggested that the process of uploading and reporting testing data be simplified and a single point-of-entry for data be established.

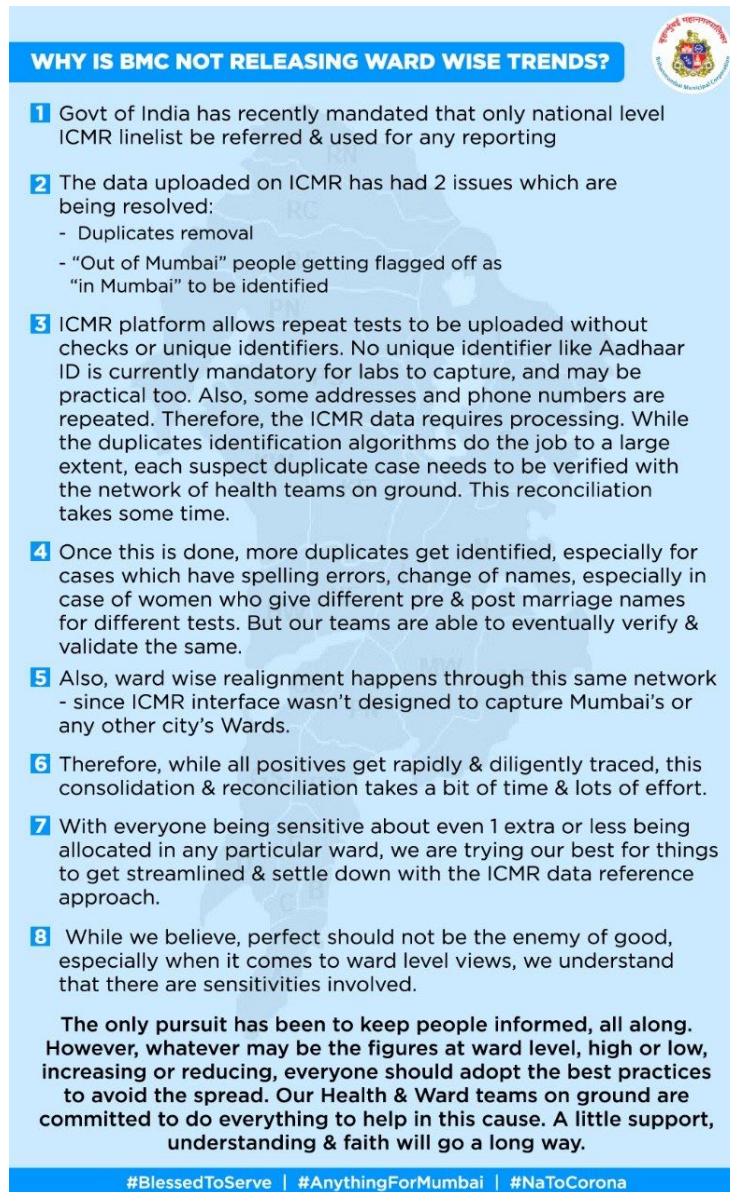
Similar problems of data discrepancies and duplication were noted in Mumbai. The BMC had been reporting data on COVID-19 cases and deaths in the city. However, its data did not match the data aggregated by the state of Maharashtra. According to a *Hindustan Times* report of 28 April 2020, the state health department's figure for coronavirus cases in Mumbai was 5,776, while the BMC had recorded only 5,589 (S. Deshpande 2020). Such problems, it emerged, were a consequence of data being uploaded separately to federated databases and then being cumulatively collated. The BMC maintains a city-level database that is managed by the municipal health department. The private labs in Mumbai that test for COVID-19 cases report their results first to the ICMR, from which the BMC then collects this data, usually after a gap of a day or two. The Maharashtra state health department, however, was collecting the data from the BMC as well as the private lab testing data from the ICMR—hence, the mismatch between their two sets of figures.

Subsequent de-duplication exercises, both in the above instance—the BMC's problem of duplication was eventually resolved through reconciliation and de-duplication exercises (S. Deshpande 2020)—and for India's pandemic databases generally, offer a unique vantage point for interrogating data problems that emerge from the use of multiple databases. Mumbai is the only city that has been releasing data at the level of administrative wards along with cumulative city-level data. For this purpose, the BMC set up a COVID-19 war room where it records COVID-19 data received from Mumbai's 24 wards (D. Singh 2020)—each ward disaggregates

4 *Rakesh Malhotra v Government of National Capital Territory of Delhi and ORS*, filed by Rakesh Malhotra, W.P. (C), 3031/2020, High Court of Delhi, New Delhi.
http://delhihighcourt.nic.in/writereaddata/orderSan_Pdf/hko/2020/67833_2020.pdf.

data received through the ICMR system to provide daily figures on new COVID-19 cases, deaths, and recoveries. However, at one point during the pandemic the BMC temporarily stopped disclosing this data, sparking public debate and speculation in the media as to the reasons behind this (D. Singh 2020).

The BMC's explanation, which it issued through its Twitter account, cited cases of data 'duplication' and errors in ICMR data that made it difficult to report the official data with confidence.



WHY IS BMC NOT RELEASING WARD WISE TRENDS?

- 1 Govt of India has recently mandated that only national level ICMR linelist be referred & used for any reporting
- 2 The data uploaded on ICMR has had 2 issues which are being resolved:
 - Duplicates removal
 - "Out of Mumbai" people getting flagged off as "in Mumbai" to be identified
- 3 ICMR platform allows repeat tests to be uploaded without checks or unique identifiers. No unique identifier like Aadhaar ID is currently mandatory for labs to capture, and may be practical too. Also, some addresses and phone numbers are repeated. Therefore, the ICMR data requires processing. While the duplicates identification algorithms do the job to a large extent, each suspect duplicate case needs to be verified with the network of health teams on ground. This reconciliation takes some time.
- 4 Once this is done, more duplicates get identified, especially for cases which have spelling errors, change of names, especially in case of women who give different pre & post marriage names for different tests. But our teams are able to eventually verify & validate the same.
- 5 Also, ward wise realignment happens through this same network - since ICMR interface wasn't designed to capture Mumbai's or any other city's Wards.
- 6 Therefore, while all positives get rapidly & diligently traced, this consolidation & reconciliation takes a bit of time & lots of effort.
- 7 With everyone being sensitive about even 1 extra or less being allocated in any particular ward, we are trying our best for things to get streamlined & settle down with the ICMR data reference approach.
- 8 While we believe, perfect should not be the enemy of good, especially when it comes to ward level views, we understand that there are sensitivities involved.

The only pursuit has been to keep people informed, all along. However, whatever may be the figures at ward level, high or low, increasing or reducing, everyone should adopt the best practices to avoid the spread. Our Health & Ward teams on ground are committed to do everything to help in this cause. A little support, understanding & faith will go a long way.

#BlessedToServe | #AnythingForMumbai | #NaToCorona

1. Brihanmumbai Municipal Corporation, Twitter feed, April 30, 2020.
<https://twitter.com/mybmc/status/1255944605062725632>.

The government of India had mandated that only ICMR data could be used for reporting. However, the ICMR data, the BMC declared, was full of duplications and errors, with re-tests being added to case tallies and multiple cases showing the same address and phone numbers or faulty biographical information. In relation to the latter, the BMC, explained, inadequate information was being recorded on the sample vials sent to the test labs. Surnames were often not provided or contained spelling errors, which meant that the correct information had to be sought from local administrative officers. Lab technicians reportedly faced further confusion and difficulty when it came to verifying whether incoming samples were first tests or follow-up cases. The need to verify this information in order to assign cases to the correct administrative wards resulted in further delays (Hindustan Times 2020).

To resolve these problems, the BMC declared that it was initiating a ‘data reconciliation’ process. It would be assisted in this work by on-the-ground health teams, in conjunction with the ICMR (BrihanMumbai Municipal Corporation 2020). Since then, to ensure ‘internal consistency’ of the data across state and national databases it has introduced tighter digital integration, streamlined data collection procedures, and initiated in-person verification of patients and their contacts. Capturing COVID testing data and its digital integration across multiple databases has thus been a tedious process.

The nature of provincialised databases, which tend to proliferate in federal government structures, and their need for precise data categories and data seeding across them, in themselves generate data problems. As an illustration of this, a further factor behind the BMC’s lack of confidence in the official data was the latter’s inclusion of ‘out of Mumbai’ cases—i.e., residents of Maharashtra who had tested positive in other states but were incorrectly classified by the ICMR as ‘in Mumbai’ cases. It is clearly in the interests of Mumbai, as well as other states and cities, to weed out such cases in order to bring down their individual case tallies. That is what the BMC had sought to do. However, assigning cases to their actual locations became problematic as people began moving across the country.

In May 2020, the large-scale, migrant workers’ exodus that was taking place across the country gained impetus when state governments began operating *Shramik* trains (literally meaning ‘labourer trains’) to transport workers desperately trying to return to their home states. In the first 15 days, these trains carried around 0.8 million people (eight lacs) from COVID-19 containment zones to non-containment zones. Domestic flights also started operating around the same time. Inter-state migrants had often tested positive in states other than their home states. However, such cases now became more prevalent as they moved across states to reach their homes. As a result, it became difficult to identify where they had contracted the disease. Around the same month, an ‘unassigned’ column began

to appear as a new category in government case-counts. The official explanation maintained that this column had been added to trace COVID-19 positive persons who had been travelling (Hindustan Times 2020). Among patients who were residents of one state but had been working in another, positive cases were now being allocated to the 'unassigned' column until they could be assigned to the location where they had contracted the disease. On top of this, states were placing COVID-19 cases into the 'unassigned' column when they were unable to assign them immediately to districts within the state. Not surprisingly, the number of 'unassigned' cases spiked. At one point the number of such cases jumped to almost 19 times higher, even as the ICMR tried to 'reassign' them (Mehrotra 2020b).

The rule of thumb seems to have been to automatically assign people to the state in which they provide their test samples. However, for people on the move, administrative officials of the integrated disease surveillance network and the ICMR must determine both where these individuals contracted COVID-19 and, for the purpose of quarantine and hospitalisation measures, their current location. This could be further complicated by the fact that testing requires individuals at the point of sample collection to provide a valid identification document, usually the Aadhaar ID, which contains their residential address. The process of verifying all this information could be time-consuming, in some instances impossible, and many cases remained 'unassigned' to any state. In official government figures the number of these 'unassigned' cases was often drastically reduced, with no indication as to whether they had been assigned to particular states or simply abandoned due to lack of information (Sinha 2020).

The challenges involved in integrating COVID-19 databases with existing Aadhaar identity databases are important for understanding the flawed logic of database governmentality. It is important to stress that the lack of integration between newer digital databases and older analogue ones results in biopolitical failures (Dandurand 2019). Aadhaar-linked identity databases for voters, pensioners, and welfare beneficiaries, as we have mentioned, have been undergoing routine de-duplications and reconciliations since the onset of the biometric project in 2009. In the process of constantly updating databases, people lose their social identities and become abstract data over and over again. Many are unable to translate into de-duplicated data that can be seeded across multiple databases and are therefore abandoned as 'fake', 'duplicate', or 'ghost'. During the pandemic, multiple COVID-19 pandemic databases were synced with Aadhaar data. This led to the abandonment (as with individuals categorised as 'other') and the 'unassignment' (as with migrant workers across states) of COVID-19 cases, as these databases attempted to cull precise data categories from the complex lived realities of disease transmission.

Moreover, existing documents, such as the Central Government Health Scheme (CGHS) card, that are necessary for accessing treatment for other ailments, have been rendered inadequate for accessing COVID-19 testing services. Up until August 2020, vague government guidelines listed the information required of people seeking a COVID test, such as a functioning phone number and proof of address, without explicitly mentioning that Aadhaar details were also mandatory. This created confusion, causing those who were unaware of this new stipulation to make multiple visits to testing centres to get their RT-PCR test (Kharb 2020).

The specificities of local administrative structures, shifting guidelines, and patient classifications, as they are incorporated into databases, create complexities in accessing care during a pandemic. This is evident in data problems that arise when people are mapped across multiple databases maintained at state and central levels in India. First, COVID-19 databases remain provincialised, and attempts to integrate national-level or even state-level data have been inadequate and confusing. Second, as they attempt to digitally identify persons as per administrative criteria and precise technical procedures, databases encounter identities that are not so easily categorised. Databases confront the 'gap between the classificatory order of bureaucracy and the world that such an order refers to' (Gupta 2013, 437). As COVID-19 data throws up problems of 'unassignment', data inconsistency, and the abandonment of data, the situation calls for a granular analysis of post-colonial bureaucratic processes that feed into data problems. The unassignment and the duplication of data across COVID-19 databases, as with other databases in the country, are directly related to the incommensurability of bureaucratic written forms that presume the precise self-representation of names and of residence—'trace-marks' of citizenship—that are difficult to extract from the complex realities of illiteracy, caste-class inequality, stress mobilities, displacement, and deprivation. In such a context, patients' samples—as units of biological and biographical information crucial for generating testing data and informing contact-tracing mechanisms and containment strategies—create new forms of untraceability. In the context of the pandemic, data problems are a function of administrative complications, the provincialisation of databases, and the incommensurability of biographies of disease with databases. Pandemic databases, as we see, are insufficient technologies for handling the complex lived realities of disease.

Testing databases are thus ambivalent technologies inserted into complex social, political, and administrative landscapes to combat a pandemic. As databases engender data problems, multiple attempts are made to resolve such problems by tending to their capacities for translation. The response to data problems, however, denotes the anti-political imperative of database governmentality.

Across databasing attempts, data problems are considered temporary technical problems instead of legal or even moral ones. Welfare denials and suffering due to Aadhaar database failures are depoliticised, as Aadhaar architects downplay them as insignificant technical errors and teething problems that can be resolved over time through upgrades and *ad hoc* re-engineering (Dreze et al. 2017). This indicates that databases and their affordances are thought to evolve and change over time. In this regard, Cohen (2019) notes, the governmentality of databases that require constant tending through upgrading and cyclical processes of de-duplication and reconciliation, replaces the governmentality of welfare. The database(s) 'supplants' the population as the locus of governance, and the care of the population becomes less about the biopolitical conduct of the masses and more about the care of databases as 'living' things (Cohen 2019, 336).

Database governmentality, the timely care of databases, and tending to data problems are of significant import in the management of a pandemic. In the context of COVID-19, there have been several attempts to resolve data problems. For instance, some Indian states have set up death audit committees, there is a push for technological and administrative integration to manage and rationalise all data, and central government's health authorities are mired in a constant struggle to de-duplicate and reconcile all the data across multiple databases. The RT-PCR app, with its linked database, has undergone multiple upgrades throughout the pandemic to account for changing testing strategies (National Informatics Centre 2020). However, in a rapidly changing scenario, databases collating testing data are unable to account for the temporalities and socio-economic complexities of COVID-19 transmission, are incommensurate with rapidly changing testing strategies, and thus produce poor pandemic data. These databases have largely misrepresented the scale of infection, affecting pandemic narratives, travel restrictions, and quarantine and containment strategies, while data problems have had a significant impact on pandemic control in India (Mukherjee et al. 2021).

Database thinking and digitised governance, despite their obvious failures, are important pandemic strategies. Cities such as Delhi have attempted to create even more databases in response to COVID-19. The provincialised nature of database governmentality fosters the proliferation of databases, even as centralised databases falter. For example, in addition to the testing results uploaded by different labs through multiple online portals, the number of available beds for COVID-19 patients in Delhi is also available as public information on the 'Delhi Corona' mobile app (Anand 2020). The numbers on this app, however, often do not match the actual number of vacant beds on the ground (A. Singh 2020). The official explanation for this has been that health system functionaries are overworked and that there is a lag in hospitals uploading relevant data—the notion of 'live' data streams takes no account of the labour entailed by data entry. Such

discrepancies often cost lives. Patients end up being dragged across the city in the search for available beds, even as the app shows vacancies. Some of them end up dying before they can be admitted.

Conclusion

In the 1970s, when India was the last potential hotspot for smallpox, an offensive strategy of ferreting out each incidence of smallpox case and administering strict containment strategies was instituted to rein in the epidemic. While administering vaccines in hotspot areas was the mainstay of smallpox eradication, it also entailed on-the-ground volunteer 'commando units' armed with 'imprests'⁵ and rumour registers, actively chasing smallpox cases and facilitating containment (Naraindas 2020). By 1975, India was free of smallpox. The response to the COVID-19 pandemic has involved the deployment of a host of sophisticated technologies to control the spread of infection too. However, testing technologies and databases, as they serve to compress complex realities into real-time data, are unable to keep up with it.

To respond to faulty databases with a better, cleaner, faster, statistical feed on death, disease, and suffering is, as Raji notes, to have missed the point (Raji 2020). The purpose of this article is not to argue for better databases, nor even to argue against them. Rather, it is to consider contemporary developments around processing populations into databases based on fixed criteria, and to critique the emergent imaginary of the nation-as-a-database. In this article, we show that databasing governmentality, and its infrastructural apparatus, has implications for the exclusions it fosters in the processes of translation and interaction involving people and multiple databases. The pandemic provides a unique vantage point for zooming in on a host of data problems that emerge as databases are unable to account for pandemic temporalities and the socio-economic complexities of disease transmission. Moreover, the provincialised nature of pandemic databases leads to recurring data problems. Multiple databases are generated and maintained, each maintaining only partial and belated alignment with pandemic realities, signifying a shift away from biopolitical conduct and towards database governmentality.

Acknowledgements

We sincerely thank the anonymous reviewers and editors of *MAT* for their detailed comments and continued engagement with our paper. We would like to thank

5 The term 'imprest' refers to petty cash or money that was made available to smallpox volunteers for personal use to facilitate containment measures in rural India (Naraindas 2020).

Professor Dr Ursula Rao for her guidance in the formulation of our arguments. We would also like to thank graduate students at the Universität Leipzig and Max Planck Institute of Social Anthropology, Halle for their engaging conversations on key ideas around databasing and data problems.

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