

Immunisation Coverage in India An Urban Conundrum

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This article examines the decline in coverage levels of the Routine Immunisation Programme in the better-governed states across three rounds of the District Level Household and Facility Survey. The analysis points to an urban conundrum where proximity to urban centres is a “risk factor.” An understanding of peri-urbanisation processes is essential for improving outcomes and governance in urban health services and the National Urban Health Mission.

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The Universal Immunisation or Routine Immunisation (RI) Programme is a key public health programme and a gigantic task in terms of reaching out to a large number of infants, children and mothers. This free and universal programme is noted for its emphasis on provisioning and coverage, and is marked by high demand too. Achieving the targets for immunisation as envisioned in the programme rests on several aspects: (i) supply chain logistics (including all-weather roads); (ii) cold chain (including power supply); (iii) healthcare workers and facilities (including training, organisation and supervision); (iv) availability and accessibility of vaccines; (v) resource allocation as compared with competing programmes; and (vi) other social determinants including cultural issues, fatigue and burnout.

The extent and depth of inequities in immunisation coverage has been of concern to researchers. Programmatic complexities, political and social contexts have been considered by several scholars to be key determinants of inequities while the World Health Organization

(WHO) Commission on Social Determinants of Health noted that these inequities occur generally across income quintiles. Determinants of coverage that have been previously considered include gender, birth order, mother’s education status, management and access to health services (Dasgupta and Das 2000; CSDH 2008; Mathew 2012).

Differentials in Coverage

The phenomenon of differentials in spatial coverage of vaccination both across and within states has been attributed to various socio-economic factors in the past. This situation is not unique either to India or to immunisation per se. Most public health planners at the national level are aware of relative inequities that arise during the implementation of a large centrally-driven programme. What is of concern in the present case is the seemingly coalescing nature of the declining trends initially seen in one state, and its temporal persistence as a larger phenomenon affecting several states. Existing explanations fall short in throwing light on potential explanations as well as the way forward; for most of these states are doing well in terms of standard socio-economic indicators commonly offered in the literature.

Urbanisation and urban settings are well recognised as key determinants of social and economic outcomes (CSDH 2008). This article conducts an empirical

analysis of immunisation coverage data spanning more than a decade, and contextualises the findings for their policy relevance in urban health planning. The available evidence on trends in immunisation coverage (total, rural and urban) is presented, followed by the current understanding in the literature on factors explaining the observed declines, in particular the role of urbanisation which emerges as a strong correlate. The peri-urban typology is subsequently used to put forth possible explanations and policy suggestions on the way forward in reversing these declining trends in immunisation coverage.

Analysis of Trends

The third round of the National Family Health Survey (NFHS-3) reported a decline in the proportion of fully immunised children (12–23 months) in several large well-performing states between 1999–2000 and 2005–06 (IIPS 2007). The state-level aggregates for round three of the District Level Household and Facility Survey (DLHS-3), compared to round two (DLHS-2), confirm this trend primarily for one large state, Tamil Nadu (IIPS 2010). Thus far, explanations for these declines were couched in terms of two apparently appealing narratives. While one blamed the adverse fallout of the polio eradication campaigns (repeated rounds of pulse polio disrupting routine activities), the other attributed declines to reports of deaths and adverse events following either Japanese Encephalitis and/or R1 campaigns in Kerala and Tamil Nadu specifically (Planning Commission 2002–07; Varghese et al 2013). However, these storylines fail to account for the observed declines. These

states were non-endemic for polio and had only one or two rounds of pulse polio in a year. The scale of adverse events following immunisation was also not large enough. There are no large-scale reports of vaccinophobia and vaccine hesitancy in these states that are particularly known for their responsive public health services (Dasgupta and Arora 2013).

We conducted a detailed examination of the data on immunisation coverage as available in the DLHS surveys. The DLHS-3 (2007–08) succeeds the earlier surveys conducted in 1998–99 (DLHS-1) and 2002–04 (DLHS-2), and covers 7,20,320 households in 601 districts across 34 states and union territories. It provides data at the district level on various aspects of healthcare utilisation for Reproductive and Child Health (RCH) programme components as well as infrastructure and accessibility of health facilities. It has a multistage stratified systematic sampling design with three stages: villages and wards (primary sampling unit), census enumeration blocks (urban areas only) and households (third stage). Typically 1,100–1,600 households were surveyed per district. The fourth round, DLHS-4 (2011–12) is in the process of being published in the public domain. District-level data available at the time of writing this article constrains the comparative analysis to 16 states. Fortunately, these cover the states of interest for the study.

The states which are of particular interest for our study are those which have been doing well in terms of several socio-economic parameters, alternately seen as so-called “good governance” states (Mundle et al 2012). It is of interest to see how these states perform with

respect to R1—a key marker of the state of public health services. Governance scores are defined on the basis of an exhaustive list of socio-economic indicators, and computed using statistical indexing methods. States are ranked according to these scores, and 50% of the top-ranked states are considered for analysis. These are Punjab, Haryana, Andhra Pradesh, Tamil Nadu, Gujarat, Karnataka, Maharashtra, Kerala and Himachal Pradesh (206 districts in these nine states).

Data on immunisation coverage is compared across three rounds of the DLHS. The most in-depth analysis at the household, village and district level is possible on data drawn from the DLHS-3 (2007–08); where decline or otherwise in coverage can be defined with respect to immunisation coverage achieved in DLHS-2 (2002–04). For DLHS-4, online data up to the district level was analysed for the states as available at the time of writing.

The DLHS-3 reported a decline in coverage of fully immunised children in 58% of the districts across these states as compared to DLHS-2. The proportion of such districts was as high as 87% in Tamil Nadu; followed by Maharashtra, Haryana and Punjab, all of which reported declines in more than 50% of the districts in their respective states (Figure 1). In terms of the extent of decline across districts, the highest decline (of 54 percentage points) was observed in Nandurbar, Maharashtra. In two of the nine states, Punjab and Maharashtra, disparity in coverage across districts also increased between DLHS-2 and DLHS-3. The range of the decline within a state is substantial: Maharashtra has

Figure 1: Comparing Declines across Rounds of DLHS Surveys

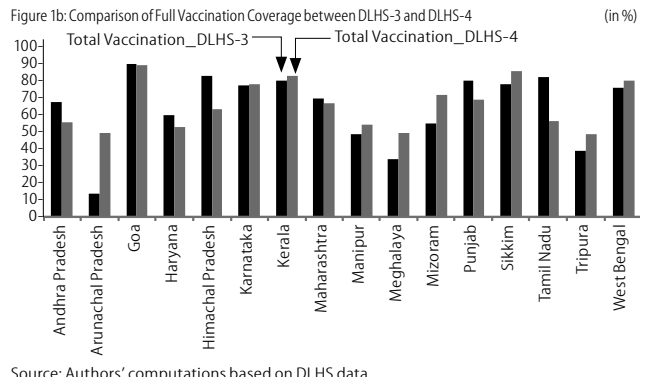
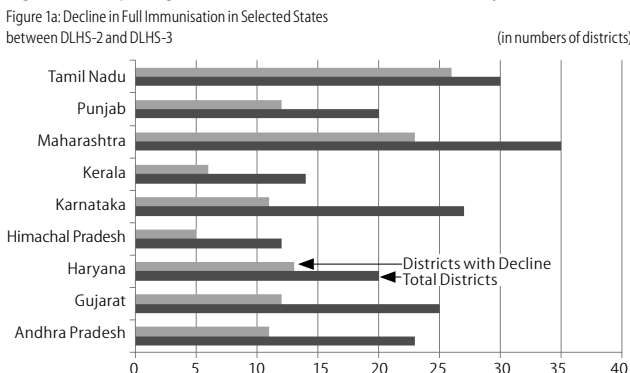
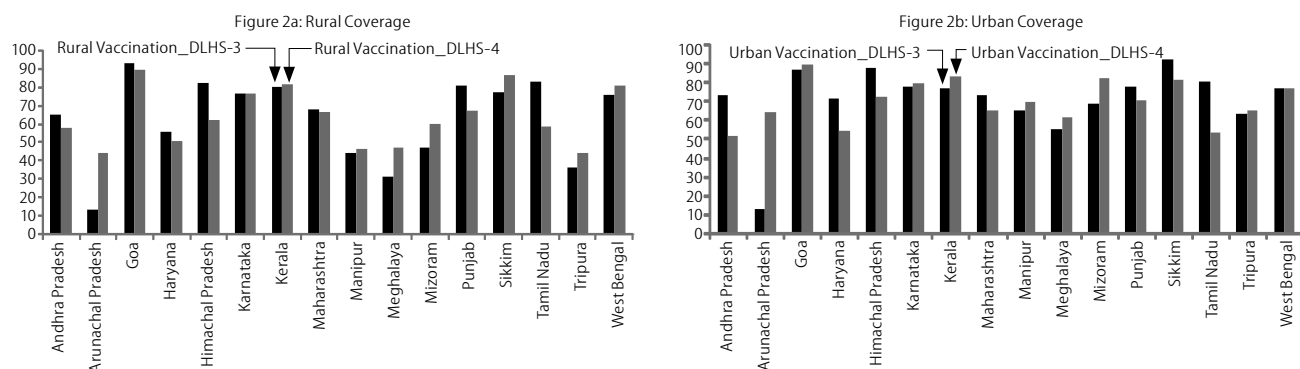


Figure 2: Differentials in Rural–Urban Coverage in Full Vaccination between DLHS-3 and DLHS-4

(in %)



Source: Author's computations based on DLHS data.

the largest gap, with declines varying from 17% to 92%; followed by Haryana with a range of decline from 11% to 79% within the state.

Vaccination data on fully immunised children for the 16 states (for which DLHS-4 data is analysed) reveals that there was an increase in coverage in nine out of the 16 states. The north-eastern states have been good performers with all of them reporting an increase in coverage. However, total vaccination coverage has gone down further in DLHS-4, as compared to DLHS-3, across the otherwise good governance states except for Karnataka and Kerala where coverage has gone up by 0.9 percentage points and 3 percentage points, respectively. The range of decline in rest of the states is alarming; ranging from 3 percentage points in Maharashtra (least overall decline) to over 25 percentage points in Tamil Nadu, confirming the persistence of a declining trend over a decade.

Rural–Urban Differential

Comparing data in DLHS-4 to DLHS-3, in nine out of the 16 states, the coverage has been lower in urban than in rural areas. An overall indicator of the distribution of gains and losses across rural and urban areas is that among the 16 states for which data was available, the net gain in rural coverage has been at 10% over the DLHS-3 levels, while in the same states there has been a net loss (that is, negative gain) of 18.2% for urban areas. If we leave out the north-eastern states, then there is a net loss in both rural and urban areas, with the decline in urban areas being 24 percentage points greater

than in rural areas. Among the better administered states (with the exception of Punjab) the percentage decline in urban coverage has been higher than in rural areas in all the states. The picture is more differentiated with respect to the rest of the states in the country. West Bengal, the only other state that reports an increase in coverage (apart from the north-eastern states, Karnataka and Kerala) shows no change in its urban coverage, while the gains have been in rural areas primarily. Significantly, Sikkim—a state that has shown remarkable progress in several socio-economic indicators in recent years—reports the second highest overall coverage, but a significant decline in urban coverage (Figure 2).

District-level data on urban vaccination coverage is not available as of date. Using overall district-level coverage data for the good governance states, we constructed the series on differential in coverage between DLHS-2 and DLHS-4, and compared it with the differential in urbanisation between 2001 and 2011. The correlation is negative, signifying that higher the urbanisation, greater has been the fall in immunisation coverage at the district level in this intervening period.

Special focus states, which were considered to be relatively poor performers or facing specific constraints, gained special attention as the Empowered Action Group (EAG) category. These states showed improvement of coverage between DLHS-2 and DLHS-3, which is in sharp contrast to the trends described so far. This can be attributed to the strengthening of RI in these states as a result of the additional inputs for the

polio eradication campaign. High RI coverage is one of the key prerequisites for polio eradication and therefore several steps were taken to strengthen the RI programme in the EAG states (many of which were also endemic for polio) since 2000. The increased emphasis on RI paid off in states such as Bihar, Chhattisgarh, Jharkhand and Uttar Pradesh (Dasgupta 2009). The increase was most dramatic in Bihar and Jharkhand—a doubling of the rate from 20.7% to 41.4%, and 5.7% to 54.1 %, respectively.

An earlier spatial epidemiological approach-based analysis of the differentials in coverage between DLHS-2 and DLHS-3 found that urbanisation is a key determinant in explaining the observed time trends in immunisation coverage at the district level (Macintyre et al 2002). This econometric estimation reveals that while poverty and lack of access to healthcare facilities in the public sector are still significant in explaining lower levels of immunisation coverage, districts with higher levels of urbanisation have a higher probability of showing a decline in coverage (Dasgupta et al 2014).

The Urban Conundrum

Contrary to conventional wisdom, urbanisation thus emerges as a key “risk factor.” India’s rapid urbanisation, particularly in certain states, has been characterised by social compression or intensification with a proliferation of what has been commonly lumped together as peri-urban areas. Human settlements span a range of institutional structures, in which the rural, urban and peri-urban coexist with dynamic interdependencies (Dasgupta and Morton 2014). Effective

policy interventions need to recognise the dynamics of this linked system.

Recognising the importance of this continuum, we draw upon the analytical framework proposed by Iaquina and Drescher (2000) for an understanding and explanation of the potential implications of service delivery and demand for immunisation services in the changing urban scenarios. In this approach, five classes of institutional contexts are identified, each corresponding to a specific peri-urban type: (i) village peri-urban (network-induced institutional context), (ii) diffuse peri-urban (amalgamated institutional context), (iii) chain peri-urban (reconstituted institutional context), (iv) in-place peri-urban (traditional institutional context), and (v) absorbed peri-urban (residual institutional context).

This framework has not yet been applied to examine implications for governance for urban health services. Drawing upon their framework, we propose potential changes that may improve RI delivery in different types of peri-urban settings. The RI programme is very heavily supply-driven and reconstitution of institutions is likely to have significant bearing upon its delivery.

National Urban Health Mission

The immunisation programme is a significant marker of health service delivery rather than an end in itself; this analysis thus has a bearing upon urban health services in a general sense. Traditionally, the public health service system in India has been overwhelmingly oriented to the needs of rural populations. Key initiatives such as the India Population Project addressed slum populations in large cities but functioned within the reductionism of RCH frameworks. There has conventionally been a lack of programmes to make well-rounded primary healthcare available to urban and peri-urban populations.

This is in dissonance with current trends in urban transformations (Denis et al 2012; Mukhopadhyay and Maringanti 2014). Analyses of the 2011 Census have pointed to two key facts: (i) the absolute growth in urban population (91 million) exceeding that of the rural component; and (ii) a threefold rise in census towns as compared to a marginal

rise in statutory towns (Pradhan 2013). At the all-India level, the share of new census towns to total urban population growth between 2001 and 2011 is about 30%; Kerala and West Bengal are among the larger states with highest contribution. The number of new census towns in a district is a function of other district characteristics such as its urbanisation rate. Denis and Marius-Gnanou (2011) have used the concept of settlement agglomeration to demonstrate higher levels of urban population than classifications as per census definitions. The critical governance implication for census towns (which are rural settlements with urban characteristics), is that they do not receive any urban services as long as they do not qualify as municipalities. About a third of the population in these new census towns are in the proximity of Class I towns but remain excluded from the municipal services. Tamil Nadu is an exceptional case where 566 town panchayats were reclassified as village panchayats.

The National Urban Health Mission (NUHM) aims to provide health services to 779 cities with a population of above 50,000 and all the district and state headquarters (irrespective of the population size). This size criterion excludes more than half the statutory towns and certainly the census towns not to speak of the settlement agglomerations. The National Vaccine Policy has no mention of urban exclusions and peri-urban areas, least of all specific strategies to address issues of coverage.

Are we witnessing an unprecedented challenge in performance of the immunisation programme in urban and urbanising India? The urban local body as a unit of planning shall be centre stage in the NUHM; but then the design of the mission is highly selective and fails to grasp the nuances of the urban transformation. We hope this exploration shall provide critical insights to stimulate research and planning for strengthening services in urban India.

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