Report on

The STATE of HEALTH of MUMBAI

July 2017

I.   Foreword

Despite its claims of being a world-class metropolis, Mumbai is a decidedly unhealthy city. It is characterised by rising cases of dengue and tuberculosis, including drug-resistant strains of the latter. Child malnutrition is rampant, and some parts of the city have even seen malnutrition deaths in the recent past. Such a situation does not portend well for the urbs prima of the country.

The authorities in charge of running the city have not managed to check the spread of various major diseases. The following statistics make this amply clear—

- The number of dengue cases rose from 4,867 in 2012-13 to 17,771 in 2016-17—a 265% increase.

- When it comes to tuberculosis, the number of cases rose from 36,417 in 2012-13 to 50,001 in 2016-17. However, the number of cases treated through Directly Observed Treatment Short-course (DOTS) nearly halved in five years—from 30,828 in 2012 to 15,767 in 2016.

- At the same time, the percentage of defaulters in DOTS treatment increased from 9% (2,638 out of 30,828) in 2012 to 19% (2,927 out of 15,767) in 2016, at a time when the government is actively promoting the 'TB haarega, desh jeetega' campaign.

This indicates that various government initiatives to check such diseases have not had the desired effect. In spite of this, elected representatives have not adequately addressed these major public concerns, as is evident from the following—

- Municipal councillors asked only 45 questions in the past five years on TB, compared to 68 questions on naming/renaming of hospitals/health centres/cemeteries in the same period.

- It is estimated that 225 people died of diarrhoea in 2016-17, out of which 33% were children 4 years of age or younger. However, public health committee councillors did not raise even a single issue on it in 2016-17.

For Mumbai, money is most definitely not the problem. The city's health budget in 2017-18 is a massive Rs. 3,312 crores, only marginally less than the Thane Municipal Corporation's total budget (Rs. 3,390 crores) for 2017-18. If these monetary resources are channelized better, then improving the state of health would not be as uphill a task as it appears at present. Here is what can be done to ensure this—

Firstly, there is an urgent need to revamp and improve the primary health care mechanism so that the common people can access the best quality services in their own neighbourhood. Municipal dispensaries suffer from inadequate resources, so much so—if we go by the official word—that even diagnosis of common diseases is a challenge. M/E ward, for instance, claims that confirmed diagnosis of dengue is not done at the dispensary level, although every ward is equipped with the Rapid Test Kit, which is used to diagnose dengue. Across the city, the number of patients seeking treatment for dengue in dispensaries has increased by 40 times from 26 (2012-13) to 1039 (2016-17). If these patients are able to get clearer information about the status of their own health, they would be less likely to shift to the private sector for treatment.

Secondly, the health management information system needs to be much better maintained. Cause-specific death data must be available with the Medical Officer Health (MOH). At present, this data is not available, due to a change in software from System Application Protocol (SAP) to the centrally managed Civil Registration System (CRS). If this data is available, the MCGM will be able to gauge the seriousness of various diseases and formulate policies accordingly.

For this white paper, we have not received data for cause-specific deaths from January 2016. Hence, for the first time, we have extrapolated this data using the Autoregressive Integrated Moving Average (ARIMA). Through this method, we have achieved the closest possible accuracy of 95.5%

There is no way that any government can confront public health challenges if it has no idea about the magnitude of the problem at hand. Consider this: on one hand, RTI data suggests that there were 17,771 dengue cases in 2016-17. However, the total estimated cases of dengue, as per a household survey of over 20,000 households, were as high as 1,09,443. These would include cases in government hospitals/dispensaries as well as in private hospitals/clinics. One wonders how the authorities would formulate a policy to tackle dengue, if there is such a huge gap between government figures and overall estimates.

Thus, there is a need for systemic change at different levels of the administration to achieve a public health system which is accountable to the people it serves. Building such a culture of accountability is the first step towards creating world-class government health services. As India's financial capital, Mumbai must take the lead in this. The 'city of dreams', as it is called, can ill afford a public health nightmare.

Nitai Mehta

Managing Trustee, Praja Foundation

II.   Acknowledgements

III. Note on Public Health Department Data

i.   RTI data

In the sections given below, we have analysed data of diseases and ailments from April 2012 to March 2017 from Municipal/Government hospitals and dispensaries. Through this data, we have attempted to assess the performance of health services provided at various levels of government using government's own data. We have collected this information through the Right to Information Act (RTI), 2005.

a.   Occurrences of diseases and ailments in municipal dispensaries and government hospitals

We received data from (171) municipal dispensaries, (26) municipal hospitals and (5) state hospitals from April 2012 to March 2017. Also, RTI data was obtained from (8) other government hospitals [which include Central Railway, Bombay Port Trust Hospital, Western Railway Hospital, Police Hospital (Nagpada and Naigaon), ESIS – Worli, Mulund, Kandivali, Marol)] and (12) Police Dispensaries from April'2012 to March'2017. Kindly refer to Annexure 1 for the list of Hospitals and dispensaries. This data relates to Out Patient Department (OPD) of dispensaries and In-Patient Department (IPD) of hospitals of MCGM. Data from J.J. hospital has not been received from December'16 to March'17.

It must be noted that the data in this section includes only government dispensaries/hospitals and does not include data on occurrences of various diseases/ailments treated in private and charitable dispensaries/hospitals. According to our survey (details of which are in section V of this report), 33% households in Mumbai use only government dispensaries/hospitals. The data on cases of diseases/ailments treated in private and charitable dispensaries/hospitals was not available under RTI. Hence, we have conducted the survey to estimate certain parameters to monitor status of health of Mumbai.

a. i) Dispensary Level: Issues related to functioning

Data on availability and reach of dispensaries is important as dispensaries are often the first point of contact for citizens. If dispensaries function effectively, then citizens can access health services closer to their homes. This will also ensure that a greater number of diseases are treated at an early stage, preventing them from assuming more serious proportions.

However, as of now, it is seen that the resources at the disposal of the municipal dispensaries are not being used to the fullest possible extent. For instance, the Senior Medical Officer of M/E ward stated that confirmed diagnosis of dengue cases does not happen at the dispensary level (please refer to annexure 5). Furthermore, the Senior Medical Officer of K/W ward mentioned that the cases which test positive are sent for ELISA (Enzme Linked Immunosorbent Assay) or Polymerase Chain Reaction (PCR) tests to diagnose dengue as the Rapid kit test does not give confirmatory result (Refer annexure 6).

This is surprising, considering the fact that every municipal dispensary is supposed to be equipped with the Rapid Test Kit, which is used to diagnose dengue. If the public health department is investing on Rapid Test Kits, then why is the diagnosis claimed to be suspected or probable and not confirmed? How are patients put on dengue treatment on the basis of the results of this kit, if it cannot be relied upon to provide a correct diagnosis? Dengue is a preventable disease, the diagnosis and treatment of which should be done at primary level of public health.

Apart from the above points, some major improvements which need to be made are proper maintenance of patient records and strengthening of the civic body's health management information system (HMIS) at the dispensary level. This way, hospitals and dispensaries will be able to view an individual patient's medical history when the patient comes with a health complaint, thus providing a better diagnosis of the ailment. Proper maintenance of the HMIS will enable various authorities to analyse the macro picture with respect to the state of health in the city.

b. Causes of death

Data on cause of death is crucial to understand the extent to which various diseases pose a threat to public health. It can help set the policy agenda for the government in terms of identifying the diseases which need urgent attention and fix gaps in the public health delivery mechanism.

However, for several years after independence, there was no unified system for registering births and deaths in the country. Such a system only came into being in 1969 with enactment of the Registration of Births and Deaths Act. This legislation made registration of births and deaths mandatory and fixed the responsibility of co-ordinating the activities of registration throughout the country of the Registrar General, India. Implementation, however, is to be done by the state governments.

In Mumbai, each municipal ward has a Medical officer of health (MOH) who is the sub-registrar as provided under RBD Act 1969 and Maharashtra Rules 2000. MOH is responsible for births and deaths certificates in their wards. Data on causes of death in Mumbai helps to plan a city-level strategy for maintaining public health. When this data is disaggregated at the ward level, it can indicate what measures need to be taken in which localities. For example, if the number of diarrhoea deaths is high in a particular area, then it could call for an investigation into the quality of water there.

b. ii) Medical Certification of Cause of Death (MCCD)

The scheme of Medical Certification of Cause of Death (MCCD) under the registration of Births and Deaths (RBD) Act, 1969 provides information on causes of death, a prerequisite to monitoring health trends of the population. This scheme analyses data on causes of death according to age and sex. Data received in prescribed forms is tabulated as per the National List of Causes of Death based on Tenth Revision of International Classification of Disease (ICD- 10). ICD is the foundation for the identification of health trends and statistics globally, and the international standard for reporting diseases and health conditions. It is the diagnostic classification standard for all clinical and research purposes.

Until December 2015, information on cause of death was made available by all 24 wards of MCGM in System Application Protocol (SAP) software. SAP was a locally managed software by Public Health Department of MCGM. Due to the change in software from SAP to the centrally managed Civil Registration System (CRS), the information on cause of death is not available with the MOH of all 24 wards of Mumbai. Being the sub registrar, MOH should have access to the information on cause of death for their own ward. The information consists of cause specific deaths with ICD-10 coding and has age and gender wise segregation. This information is vital for understanding the mortality and disease trends in wards of MCGM. It was an excellent step taken to make the birth and death registration centralised under CRS wherein information could be accessed through single portal accessible to the administration as well as citizens, but the accessibility of this information was given in the form

of D-1 report at the sub registrar level which does not have information in terms of ICD-10 coding, age and gender, but only the total number of deaths. **If such is the case, then how are policy makers and researchers in health care going to get the demographics for planning and implementation?** CRS showed a lack of planning in terms of building this software.

According to the Registration of Births and Deaths Act, 1969, this data should have been made available at the Medical Officer Health (MOH) level who is the local registrar for births and deaths in Mumbai district, but since the data is now centrally managed, ward level data of cause of death is not available for Mumbai district.

    c.   **Extrapolation of cause of death data for 2016-17:**

As explained above, ward-wise information on cause of death was available till December 2015. However, after the change in software change from SAP to CRS, data is not available at the sub-registrar level in the form of the D-10 report from January 2016.Therefore, as this data was not available, Praja along with Hansa Cequity Solutions, an organisation working in data analytics, has extrapolated the cause of death data from January 2016 to March 2017.

Praja had filed RTIs in all wards of Mumbai to gather the information on cause of death in Mumbai; classified age wise, gender wise, ICD code wise. In SAP, this information was available in the form of the D-10 report. However, as of now, the sub-registrar can only access the D-1 report, which shows only the gender wise deaths.

In order to achieve closest possible accuracy, for the extrapolation, parameters such as gender, age, ICD coding and population have been used. We have also taken even seasonality into consideration. Through this we have attained the closest possible accuracy of up to 95.5%. The data made available to Praja through RTI by MOH of 24 wards in D-1 format for 2016 was 84,265 while the predicted data for the same period was 85,329.

c. i) Process of extrapolation[1]:

Data for each disease was extracted, converted into time series, further stationarity of data was checked, and it was transformed to make it stationary by differencing wherever required. Data was further treated for outliers. Tested models include Moving Average, Exponential Smoothing and Autoregressive Integrated Moving Average (ARIMA). ARIMA was used for forecasting values as error terms were minimum and this model considers trends and seasonality for forecasting values. ARIMA[2] models are, in theory, the most general class of models for forecasting a time series which can be made to be "stationary" by differencing (if necessary), perhaps in conjunction with nonlinear transformations such as logging or deflating (if necessary). A random variable that in a time series is stationary if its statistical properties are all constant over time. An ARIMA model can be viewed as a "filter" that tries to separate the signal from the noise, and the signal is then extrapolated into the future to obtain forecasts. To give some examples for the accuracy of ARIMA, predicted deaths due to diarrhoea in 2015 as per this method were 185, while the number of actual deaths was 169. For hypertension, the actual deaths were 4,486 and the predicted deaths were 4,511 for the year 2015.

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[1] Please refer annexure 6

[2] https://people.duke.edu/~rnau/411arim.htm

d. Deliberations by councillors and MLAs

This section comprises of deliberations by elected representatives in Mumbai. Data in this section has been collected through the Right to Information (RTI), Act 2005. The information includes issues raised by MLAs in the monsoon session 2015, winter session 2015 and budget session 2016; while the issues raised by councillors are from Public Health Committee meetings held between April 2016 and March 2017. Issues raised by councillors in Statutory and Special Committees meetings have also been taken. We have incorporated attendance of councillors from public health committee meetings for each financial year from 2012-13 to 2016-17.

d. i) MCGMs Public Health Committee

a) The Corporation under Section 38A (1) of the M.M.C. (Mumbai Municipal Corporation) Act, appoints the Public Health Committee out of its own body consisting of 36 members in their meeting after general elections and delegate any of their power and duties to such Committee and also define the sphere of business of Committee so appointed and direct that all matters and questions included in any such sphere shall be submitted to the Corporation with such Committee's recommendation.

b) Sphere of Business

Sphere of Business of Special Committees defined by the Corporation vide Corporation Resolution No.46, dated 11th May 1999 in exercise of the powers vested in them by Sub-Section (1) of Section 38A of the Mumbai Municipal Corporation Act, 1888, as amended up to date.

> b. i) All questions relating to the King Edward VII Memorial Hospital and Seth Gordhandas Sunderdas Medical College, Kasturba Hospital for infectious diseases, Medical Relief in the Municipal outdoor dispensaries, Medical and Nursing assistance to the poor in their homes, Venereal Diseases Dispensaries, Anti Tuberculosis League and any Medical Institution to which monetary assistance is given by the Corporation.

> b. ii) Health Department (including Street Cleaning, Conservancy, etc.) with the exception of questions pertaining to the Mechanical Branch so far as they fall within the province of the Works Committee.

At present, there are 36 members (out of which 3 are nominated) in the Public Health Committee.

ii.   Citizen Survey

Praja Foundation collects information on cases reported of diseases/ailments and causes of death from all 24 wards of Mumbai. This is government data collected under the Right to Information (RTI) Act, 2005. In this section, we are presenting a household survey mapping diseases and ailments, which should ideally be done by the Public Health Department to understand the perception of citizens about health care facilities.

The information received under RTI from various government institutions shows that dengue cases in Mumbai were 17,771 & 11,607 of dengue and malaria respectively while the survey data across all 24 wards of Mumbai showed that the cases of dengue were as high as 1,09,443 and cases of malaria were 90,703. As per the government data collected through RTI, the total number of occurrences for Dengue and Malaria as exceedingly low, when compared to the data collected by the housing survey. Information under RTI is for government facilities, but if the public Health department starts mapping diseases and ailments, then these numbers would certainly come closer.

Hence, apart from the mapping of diseases and ailments Public Health department should also be responsible for maintaining of patient records and strengthening of the civic body's health management information system (HMIS) at the dispensary level. This way, hospitals and dispensaries will be able to view an individual patient's medical history when the patient comes with a health complaint, thus providing a better diagnosis of the ailment. Proper maintenance of the HMIS will enable various authorities to analyse the macro picture with respect to the state of health in the city.

Survey Methodology

Praja Foundation had commissioned the **household survey** to Hansa Research and the survey methodology followed is as below:

- In order to meet the desired objectives of the study, we represented the city by covering a sample from each of its 227 wards. The target Group for the study was:
  - ✓ Both Males & Females
  - ✓ 18 years and above
  - ✓ Belonging to that particular ward.
- Sample quotas were set for representing gender and age groups on the basis of their split available through Indian Readership Study (Large scale baseline study conducted nationally by Media Research Users Council (MRUC) for Mumbai Municipal Corporation Region.
- The required information was collected through face to face interviews with the help of structured questionnaire.
- In order to meet the respondent within a ward, following sampling process was followed:
  - ✓ 5 prominent areas in the ward were identified as the starting point
  - ✓ In each starting point about 20 individuals were selected randomly and the questionnaire was administered with them.

- Once the survey was completed, sample composition of age & gender was corrected to match the population profile using the baseline data from IRS. This helped us to make the survey findings more representatives in nature and ensured complete coverage.

- To get more accurate estimates of disease incidence, we have increased the depth of probing to ask further questions about each individual member of the household, the disease they have contracted, whether testing was sought and the nature of the hospital care availed of. This is a more robust method. What was being done earlier was that information was sought at a general household level and then this information was extrapolated to all household members.

- The numbers in the table 17 & 18 refer to the number of cases where testing was conducted and was positive for the disease in question.

- Instead of asking for details about the household in general, this year we asked for information about each member in a household who suffered from a particular disease. As a result, the overlap between private and government hospitals has reduced – this is because, now if two different members of a household visited two different types of hospitals, they are now being covered separately.

- Due to the change in methodology from a generalised household feedback to individual specific feedback, the overlap between private and government hospitals has reduced. Previously, a household where one member may have received treatment from a private hospital and another from a government hospital would be counted under 'both'. Now, with individual data being captured for each member of the household, only those members who went to both government and private hospitals would be counted under 'both'.

- **The total study sample was 20,317.**

IV. Data on Diseases/Ailments & Health Personnel in Mumbai
(Data got through RTI)

Table 1: Malaria number of cases in government dispensaries/hospital and total deaths in Mumbai from April'2012-March'2017

Years	2012-13	2013-14	2014-15	2015-16	2016-17
Number of Malaria Cases in government dispensaries/hospitals in Mumbai					
MCGM dispensaries/hospitals	18296	15987	13865	12516	9679
State hospitals	1280	1052	854	1233	1312
Other government dispensaries/hospitals	2363	1359	964	882	616
Total Cases	21939	18398	15683	14631	11607
Population /Total Cases	567	676	793	850	1072
Number of Deaths due to Malaria in Mumbai					
Total Deaths	238	202	103	116[3]*	127[4]*
Total Cases/Total Deaths	92	91	152	126	91

- Malaria cases have decreased by 47% from 2012-13 to 2016-17, which could be the result of MCGM's Fight the Bite campaign
- In 2016-17, probable deaths cases were 127. Although malaria cases have reduced by 47% in last five years, MCGM is still far from achieving the UN's Sustainable Development Goal of eradicating malaria by year 2030.

Note: (*) This is the extrapolated data.

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3 & 4 In January 2016, the MCGM's locally managed software for registration of births and deaths changed from System Application Protocol (SAP) to the centrally managed Civil Registration Systems (CRS). Therefore, the Medical Officer of Health (MOH) who is the sub-registrar under the Registration of Births & Deaths Act, 1969, has access to only the D-1 report i.e. gender-wise total deaths, but not D-10 which is cause-specific death since January 2016. Hence, we have extrapolated the cause of death data from January 2016 to March 2017 using time series to understand the information on cause of death for this period.

Table 2: Dengue number of cases in government dispensaries/hospital and total deaths in Mumbai from April'2012-March'2017

Years	2012-13	2013-14	2014-15	2015-16	2016-17
Number of Dengue Cases in government dispensaries/hospitals in Mumbai					
MCGM dispensaries/hospitals	4447	6052	8372	12870	14248
State hospitals	289	732	1523	1776	2529
Other government dispensaries/hospitals	131	477	404	598	994
Total Cases	4867	7261	10299	15244	17771
Population /Total Cases	2556	1714	1208	816	700
Number of Deaths due to Dengue in Mumbai					
Total Deaths	77	111	102	147[5]*	148[6]*
Total Cases/Total Deaths	63	65	101	104	120

- A 265% hike is seen in dengue cases in five years from 2012-13 to 2016-17 with 4,867 and 17,771 cases respectively
- Total number of death cases due to dengue as per the predicted data for the year 2016-17 is 148.

Note: (*) This is the extrapolated data.

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[5] &[6] In January 2016, the MCGM's locally managed software for registration of births and deaths changed from System Application Protocol (SAP) to the centrally managed Civil Registration Systems (CRS). Therefore, the Medical Officer of Health (MOH) who is the sub-registrar under the Registration of Births & Deaths Act, 1969, has access to only the D-1 report i.e. gender-wise total deaths, but not D-10 which is cause-specific death since January 2016. Hence, we have extrapolated the cause of death data from January 2016 to March 2017 using time series to understand the information on cause of death for this period.

Figure 1 : Discrepancy in reporting system of Malaria death (data is as per calendar year)
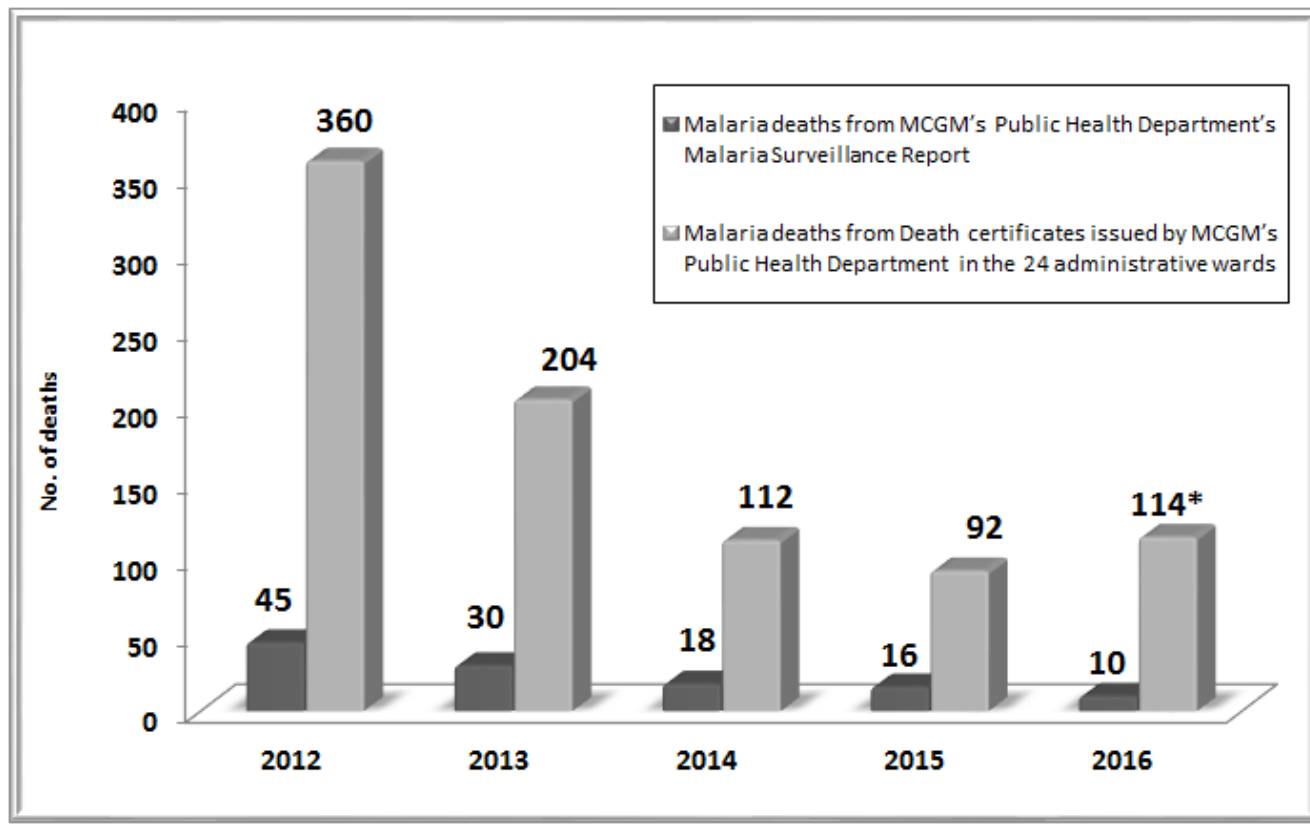
According to the malaria surveillance department of MCGM, registered number of death cases were 10 in 2016, while death cases as per the predicted data for 2016 were 114[7].

Note: (*) This is the extrapolated data.

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7 In January 2016, the MCGM's locally managed software for registration of births and deaths changed from System Application Protocol (SAP) to the centrally managed Civil Registration Systems (CRS). Therefore, the Medical Officer of Health (MOH) who is the sub-registrar under the Registration of Births & Deaths Act, 1969, has access to only the D-1 report i.e. gender-wise total deaths, but not D-10 which is cause-specific death since January 2016. Hence, we have extrapolated the cause of death data from January 2016 to March 2017 using time series to understand the information on cause of death for this period.

Table 3: Tuberculosis number of cases in government dispensaries/hospital and total deaths in Mumbai from April'2012-March'2017

Years	2012-13	2013-14	2014-15	2015-16	2016-17
Number of Tuberculosis Cases in government dispensaries/hospitals					
MCGM dispensaries/hospitals	34873	39644	40525	39060	47672
State hospitals	946	1216	1829	1645	1890
Other government dispensaries/hospitals	598	619	483	467	439
Total Cases	36417	41479	42837	41172	50001
Population /Total Cases	342	300	290	302	249
Number of Deaths due to Tuberculosis in Mumbai					
Total Deaths	7170	7319	6501	5400[8]*	6472[9]*
Total Cases/Total Deaths	5	6	7	8	8

- 50,001 Tuberculosis cases were registered at government institutions in 2016-17. Tuberculosis cases have increased by 37% in five years from 2012-13 to 2016-17
- Deaths due to tuberculosis as per the predicted data were 6,472 in the year 2016-17.

Note: (*) This is the extrapolated data.

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8 & 9 In January 2016, the MCGM's locally managed software for registration of births and deaths changed from System Application Protocol (SAP) to the centrally managed Civil Registration Systems (CRS). Therefore, the Medical Officer of Health (MOH) who is the sub-registrar under the Registration of Births & Deaths Act, 1969, has access to only the D-1 report i.e. gender-wise total deaths, but not D-10 which is cause-specific death since January 2016. Hence, we have extrapolated the cause of death data from January 2016 to March 2017 using time series to understand the information on cause of death for this period.

Figure 2 : Discrepancy in reporting system of Tuberculosis deaths (data is as per calendar year)
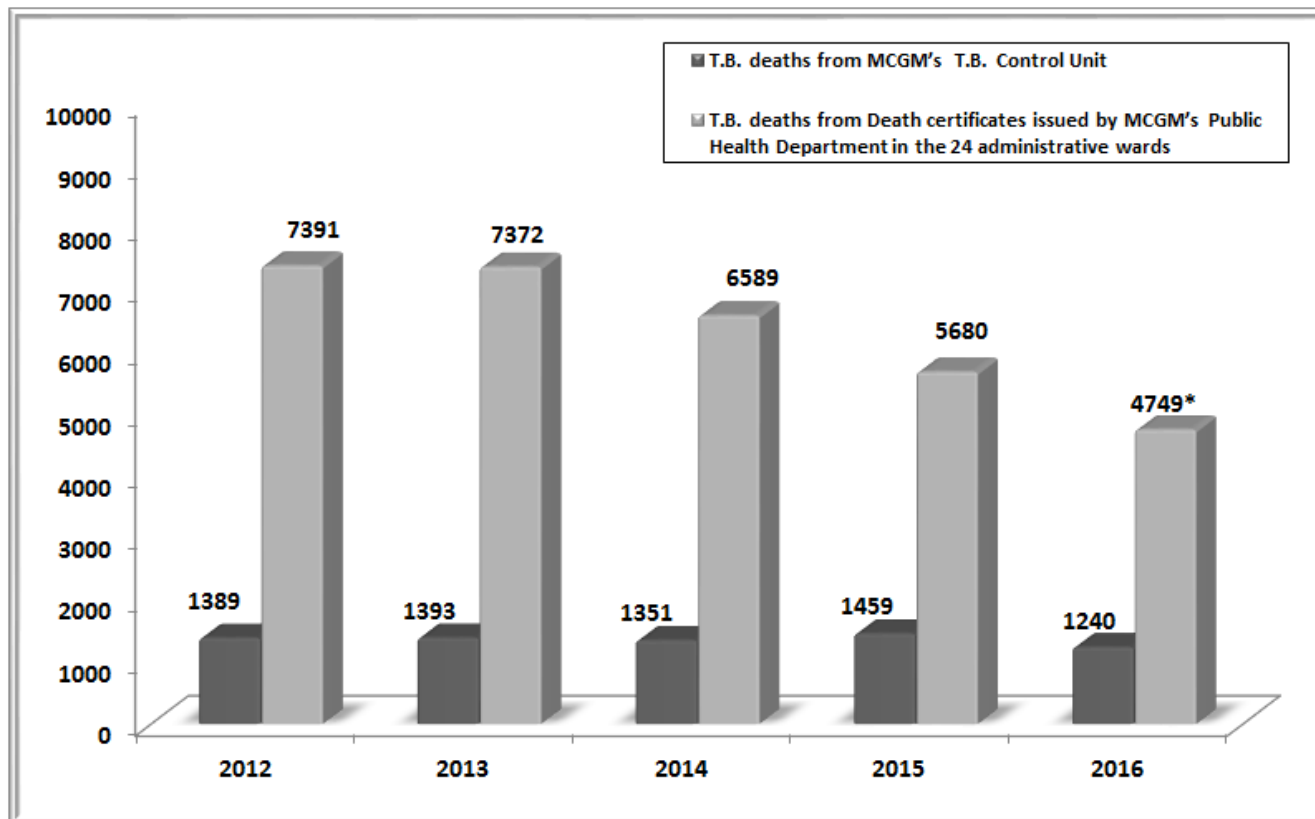
Tuberculosis deaths reported by Tuberculosis Control unit from 2016 are 1,240 while death cases as per the predicted data for 2016 were 4,749[10].

Note: (*) This is the extrapolated data.

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10 In January 2016, the MCGM's locally managed software for registration of births and deaths changed from System Application Protocol (SAP) to the centrally managed Civil Registration Systems (CRS). Therefore, the Medical Officer of Health (MOH) who is the sub-registrar under the Registration of Births & Deaths Act, 1969, has access to only the D-1 report i.e. gender-wise total deaths, but not D-10 which is cause-specific death since January 2016. Hence, we have extrapolated the cause of death data from January 2016 to March 2017 using time series to understand the information on cause of death for this period.

Table 4: Budget for Revised National Tuberculosis Control Programme (RNTCP) (Figures are in lakh)

Account Heads	Estimates (a)			Actuals (b)			Utilisation [a/b] (in %)		
	2014-15	2015-16	2016-17	2014-15	2015-16	2016-17	2014-15	2015-16	2016-17
Civil Works	11	31	40	8	13	7	74	43	19
Laboratory Materials	32	155	107	32	85	62	100	55	58
Honorarium	7	64	62	6	20	21	90	31	34
IEC	12	21	27	12	7	15	100	32	57
Equipment Maintenance	13	28	31	11	16	19	85	55	61
Training	2	7	10	2	2	11	98	28	108
Vehicle Maintenance & Vehicle hiring	89	93	125	64	82	90	72	88	73
NGO/PP Support	499	633	349	427	609	484	86	96	138
Miscellaneous	50	0	0	50	0	0	100	0	0
Medical college & Contractual Services (salary of staff)	805	841	837	518	510	510	64	61	61
Printing, Research & studies	22	53	43	20	2	30	89	3	71
Procurement of Drugs	120	79	93	120	22	101	100	27	109
Procurement of Vehicle	0	16	0	0	0	0	0	0	0
Procurement of Equipment	1	19	66	1	7	28	75	37	43
Patient support & Transportation	5	10	12	0	0	0	4	3	1
Supervision & Monitoring	39	37	55	13	15	21	33	41	38
Office Operations	0	91	95	0	55	85	0	61	89
Total	**1,708**	**2,180**	**1,951**	**1,285**	**1,444**	**1,486**	**75**	**66**	**76**

Budget for 2016-17 was 1,951 lakh and the utilisation was 76%. The major account heads with highest utilisation are procurement of drugs, NGO/PP support and training where the utilisation is exceeding 100% in FY 2016-17.

Table 5: Defaulters cases from Directly Observed Treatment, Short Course (DOTS) programme for calendar year[11]

	2012	2013	2014	2015	2016
No. of case from Hospitals/Dispensaries (a)	34548	40149	42573	41825	46422
Cases registered under DOTS (b)	30828	21550	21703	19115	15767
Defaulters from DOTS Programme (c)	2638	2575	2264	2823	2927
Defaulter cases in % (c*100/b)	9%	12%	10%	15%	19%

- Total number of Tuberculosis cases has increased in from 34,548 in 2012 to 46422 in 2016.
- Enrolment of Tuberculosis patients has decreased in DOTS programme by 49%. In 2012, 30,828 cases were enrolled under DOTS, and in 2016 these cases were 15,767.
- The number of defaulters from DOTS programme has increased by 10% in last 5 years.

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11 This information related to tuberculosis is calendar year-wise, while the information in Table 3 is financial year-wise. This is because the information for defaulters was provided by the TB control unit in calendar year-wise.

Table 6: Diarrhoea number of cases in government dispensaries/hospital and total deaths in Mumbai from April'2012-March'2017

Years	2012-13	2013-14	2014-15	2015-16	2016-17
Number of Diarrhoea Cases in government dispensaries/hospitals in Mumbai					
MCGM dispensaries/hospitals	97563	114666	113236	115759	97392
State hospitals	785	1561	1129	1741	1162
Other government dispensaries/hospitals	1479	1953	2392	1842	2089
Total Cases	99827	118180	116757	119342	100643
Population /Total Cases	125	105	107	104	124
Number of Deaths due to Diarrhoea in Mumbai					
Total Deaths	250	260	260	177[12]*	225[13]*
Total Cases/Total Deaths	399	455	449	674	447

In 2016-17, reported cases of diarrhoea were 1,00,643, but the existing trend shows that diarrhoea cases are as high as previous years. Death cases as per the predicted data were 225 in the year 2016-17.

Note: (*) This is the extrapolated data.

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12 &13 In January 2016, the MCGM's locally managed software for registration of births and deaths changed from System Application Protocol (SAP) to the centrally managed Civil Registration Systems (CRS). Therefore, the Medical Officer of Health (MOH) who is the sub-registrar under the Registration of Births & Deaths Act, 1969, has access to only the D-1 report i.e. gender-wise total deaths, but not D-10 which is cause-specific death since January 2016. Hence, we have extrapolated the cause of death data from January 2016 to March 2017 using time series to understand the information on cause of death for this period.

Table 7: Cholera number of cases in government dispensaries/hospital and total deaths in Mumbai from April'2012-March'2017

Years	2012-13	2013-14	2014-15	2015-16	2016-17
Number of Cholera Cases in government dispensaries/hospitals in Mumbai					
MCGM dispensaries/hospitals	187	89	19	187	104
State hospitals	11	7	11	6	5
Other government dispensaries/hospitals	0	0	1	14	0
Total Cases	198	96	31	207	109
Population /Total Cases	62840	129608	401367	60108	114150
Number of Deaths due to Cholera in Mumbai					
Total Deaths	10	7	3	5[14]*	8[15]*
Total Cases/Total Deaths	20	14	10	41	14

The number of cholera cases was 31 in 2014-15 from the government institutions, but this number went up to 207 in 2015-16; and in the year 2016-17, cholera cases were 109. This trend highlights the resurgence of cholera which was under control until 2014-15. The number of deaths as per the predicted cases in 2016-17 is 8.

Table 8: Typhoid number of cases in government dispensaries/hospital and total deaths in Mumbai from April'2012-March'2017

Years	2012-13	2013-14	2014-15	2015-16	2016-17
Number of Typhoid Cases in government dispensaries/hospitals in Mumbai					
MCGM dispensaries/hospitals	4160	6492	4355	4486	3483
State hospitals	200	232	193	538	433
Other government dispensaries/hospitals	261	607	390	306	497
Total Cases	4621	7331	4938	5330	4413
Population /Total Cases	2693	1697	2520	2334	2819
Number of Deaths due to Typhoid in Mumbai					
Total Deaths	9	10	3	7[16]*	6[17]*
Total Cases/Total Deaths	513	733	1646	761	736

There were 4,413 cases of typhoid in governmental institutions in 2016-17. But compared to information from government institutions in previous years from 2012-13 to 2016-17, cases of typhoid have not shown any drastic decline. Total number of as per the predicted data for the year 2016-17 is 6.

Note: (*) This is the extrapolated data

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14 15 16 & 17 In January 2016, the MCGM's locally managed software for registration of births and deaths changed from System Application Protocol (SAP) to the centrally managed Civil Registration Systems (CRS). Therefore, the Medical Officer of Health (MOH) who is the sub-registrar under the Registration of Births & Deaths Act, 1969, has access to only the D-1 report i.e. gender-wise total deaths, but not D-10 which is cause-specific death since January 2016. Hence, we have extrapolated the cause of death data from January 2016 to March 2017 using time series to understand the information on cause of death for this period.

Table 9: Diabetes number of cases in government dispensaries/hospital and total deaths in Mumbai from April'2012-March'2017

Years	2012-13	2013-14	2014-15	2015-16	2016-17
Number of Diabetes Cases in government dispensaries/hospitals in Mumbai					
MCGM dispensaries/hospitals	19423	35118	43265	20449	22669
State hospitals	728	742	1135	832	957
Other government dispensaries/hospitals	4794	4981	4310	9415	8894
Total Cases	24945	40841	48710	30696	32520
Population /Total Cases	499	305	255	405	383
Number of Deaths due to Diabetes in Mumbai					
Total Deaths	2575	2421	2493	2308[18]*	2675[19]
Total Cases/Total Deaths	10	17	20	13	12

Diabetes cases have increased from 30,696 in 2015-16 to 32,520 in 2016-17. Diabetes cases have increased 30% in five years from 2012-13 to 2016-17. These are the new cases registered in government institutions. Deaths due to diabetes as per the predicted data are 2,675 in 2016-17.

Table 10: Hypertension number of cases in government dispensaries/hospital and total deaths in Mumbai from April'2012-March'2017

Years	2012-13	2013-14	2014-15	2015-16	2016-17
Number of Hypertension Cases in government dispensaries/hospitals in Mumbai					
MCGM dispensaries/hospitals	21005	26901	31960	22499	24261
State hospitals	921	821	1039	865	1199
Other government dispensaries/hospitals	6798	7915	5671	12597	11297
Total Cases	28724	35637	38670	35961	36757
Population /Total Cases	433	349	322	346	339
Number of Deaths due to Hypertension in Mumbai					
Total Deaths	4034	4618	5061	4232[20]*	4438[21]*
Total Cases/Total Deaths	7	8	8	8	8

Registered number of hypertension cases in government institutions is 36,757 in 2016-17. In five years from 2012-13 to 2016-17 hypertension cases have increased by 28%. It is a cause of concern that more than 4,000 people die of hypertension every year. The total number of deaths due to hypertension as per the extrapolated data is 4,438 in 2016-17.

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18 19 20 & 21 In January 2016, the MCGM's locally managed software for registration of births and deaths changed from System Application Protocol (SAP) to the centrally managed Civil Registration Systems (CRS). Therefore, the Medical Officer of Health (MOH) who is the sub-registrar under the Registration of Births & Deaths Act, 1969, has access to only the D-1 report i.e. gender-wise total deaths, but not D-10 which is cause-specific death since January 2016. Hence, we have extrapolated the cause of death data from January 2016 to March 2017 using time series to understand the information on cause of death for this period.

Table 11: Causes of death in Mumbai from April'2012-March'2017

Cause of Death	2012-13		2013-14		2014-15		2015-16[22]*		2016-17[23]*	
	No. of Deaths	In %	No. of Deaths	In %	No. of Deaths	In %	No. of Deaths	In %	No. of Deaths	In %
Malaria (B50 TO B54)	238	0.3	202	0.2	103	0.1	116	0.1	127	0.1
Dengue (A90)	77	0.1	111	0.1	102	0.1	147	0.2	148	0.2
Tuberculosis (A-15,16,17,18,19,)	7170	8.1	7319	8.2	6501	7.2	5400	6.9	6472	7.2
Diarrhoea (A09)	250	0.3	260	0.3	260	0.3	177	0.2	225	0.3
Cholera (A00)	10	0	7	0	3	0	5	0	8	0
Typhoid (A01)	9	0	10	0	3	0	7	0	6	0
Diabetes (E10-E14)	2575	2.9	2421	2.7	2493	2.7	2308	2.9	2675	3.0
Hypertension (I10-I15)	4034	4.6	4618	5.1	5061	5.6	4232	5.4	4438	4.9
HIV / AIDS (B20-24)	577	0.7	464	0.5	393	0.4	343	0.4	404	0.4
Other Cause of deaths	73615	83.1	74261	82.8	75790	83.6	65694	83.8	75315	83.9
Total Deaths	**88555**	**100**	**89673**	**100**	**90709**	**100**	**78429**	**100**	**89818**	**100**

Table 12: Age-wise percentage of causes of death in the year April'16-March'17[24]*

Cause of death	< 4 Years	5-19 Years	20-39 Years	40-59 Years	60 - Above	Not Stated
Malaria	2.4	10.2	33.9	28.3	25.2	0
Tuberculosis	1.0	6.0	31.0	38.0	24.0	0
Dengue	8.8	18.2	35.1	20.9	16.9	0
Diabetes	2.0	2.0	8.0	27.0	60.0	1.0
Diarrhoea	32.9	4.0	10.2	16.9	36.0	0
Hypertension	2.0	1.0	8.0	15.0	74.0	0
Other Cause of deaths	8.0	3.0	12.0	23.0	54.0	0

Note: (*) This is the extrapolated data.

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22 23 & 24 In January 2016, the MCGM's locally managed software for registration of births and deaths changed from System Application Protocol (SAP) to the centrally managed Civil Registration Systems (CRS). Therefore, the Medical Officer of Health (MOH) who is the sub-registrar under the Registration of Births & Deaths Act, 1969, has access to only the D-1 report i.e. gender-wise total deaths, but not D-10 which is cause-specific death since January 2016. Hence, we have extrapolated the cause of death data from January 2016 to March 2017 using time series to understand the information on cause of death for this period.

Table 13: Gender-wise percentage of causes of death in the year April'16-March'17[25]*

Cause of death	Male	Female	Not Stated
Malaria	68	32	0
Tuberculosis	67	33	0
Dengue	55	45	0
Diabetes	52	48	0
Diarrhoea	46	54	0
Hypertension	50	50	0
Other Cause of deaths	59	41	0

Table 14: Top 10 causes of death in Mumbai

Cause of Death	2011-12	2012-13	2013-14	2014-15	2015-16[26]*	2016-17[27]*
Acute Myocardial Infarction (I21-I22)	10475	9897	10187	10263	8955	8961
Other Forms of Heart Diseases (I30-I51)	7690	7488	7507	8781	6696	5659
Septicaemia (A40-A41)	6024	5611	5650	6014	5117	3787
Tuberculosis (A15-A19)	8375	7170	7319	6501	5181	6472
All Other Ischemic Heart Diseases (I20 & I23-I25)	4590	4375	4366	4554	4298	4249
All Other Hypertensive Diseases (I10,I12-I15)	3541	3585	4118	4604	3998	3407
All Other Diseases of the Respiratory System (J60-J86, J92-J98)	3934	4078	4131	4336	3674	3674
Pneumonia (J12-J18)	4072	3330	2937	3215	3129	3034
Renal Failure (N17-N19)	3734	3431	3377	3308	3065	3160
Diseases of the Liver (K70-K76)					2859	2751

Note: (*) This is the extrapolated data.

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25 26 & 27 In January 2016, the MCGM's locally managed software for registration of births and deaths changed from System Application Protocol (SAP) to the centrally managed Civil Registration Systems (CRS). Therefore, the Medical Officer of Health (MOH) who is the sub-registrar under the Registration of Births & Deaths Act, 1969, has access to only the D-1 report i.e. gender-wise total deaths, but not D-10 which is cause-specific death since January 2016. Hence, we have extrapolated the cause of death data from January 2016 to March 2017 using time series to understand the information on cause of death for this period.

Figure 3 : Shortage of staff in MCGM's dispensaries/hospitals

MCGM dispensaries/hospitals (in %)

Legend: 2013, 2014, 2015, 2016, 2017

Medical: 26, 26, 27, 32, 28
Lecturer in Medical College: 37, 20, 17, 22, 30
Para-Medical: 36, 22, 33, 28, 27
Nursing Staff: 9, 15, 11, 13, 8
Administration: 14, 14, 21, 23, 26
Labour: 15, 14, 16, 18, 21
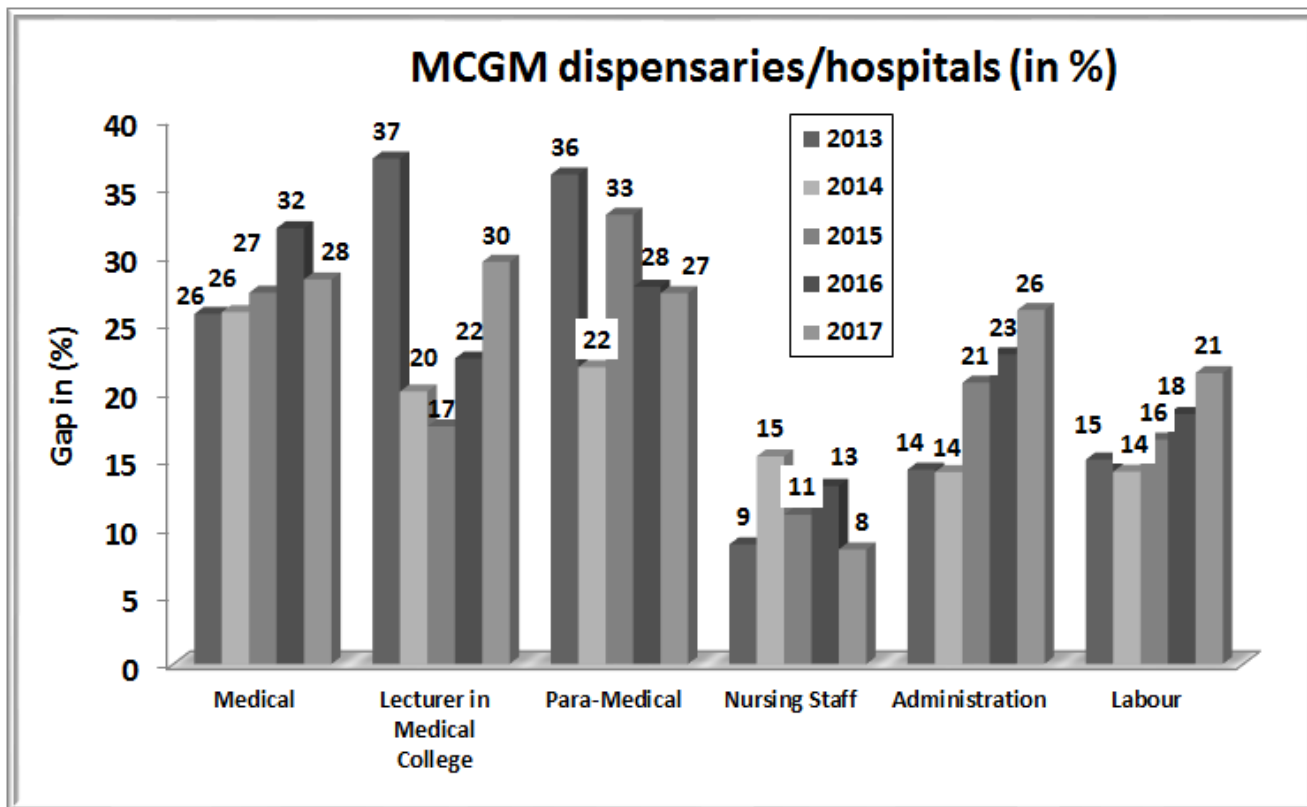
The overall gap in shortage of staff in MCGM dispensaries/hospitals is 20% with the most significant gap being in medical department (28%) and lecturers in medical college (30%) in the year 2017.

Figure 4 : Shortage of staff in State hospitals

State Hospitals (in %)

Legend: 2013, 2014, 2015, 2016, 2017

Category	2013	2014	2015	2016	2017
Medical	46	44	60	56	65
Lecturer in Medical College	38	38	66	73	62
Para-Medical	29	25	24	27	27
Nursing Staff	33	11	22	12	12
Administration	29	26	27	25	30
Labour	25	28	30	30	25

Y-axis: Gap in (%)
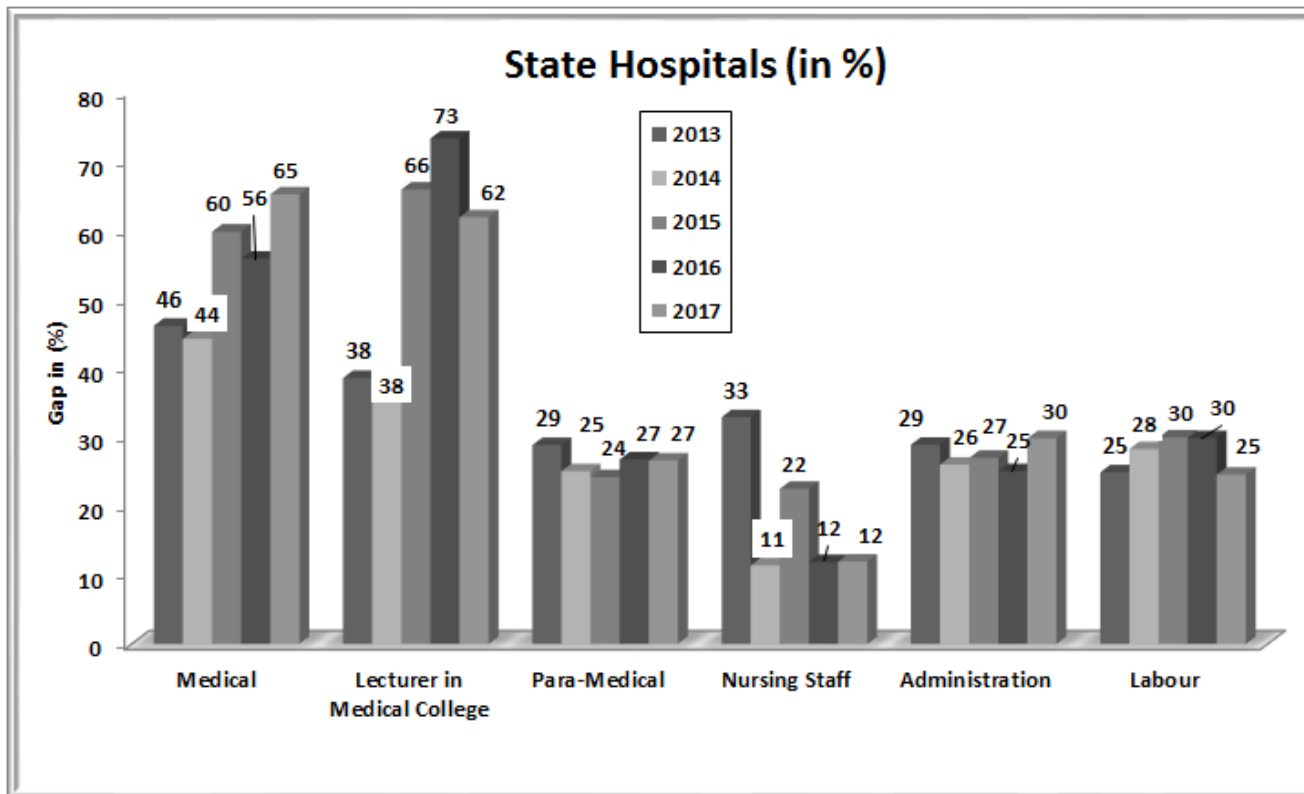
Overall gap in MCGM state hospitals with regard to shortage of staff is 22% with most significant gap in medical department (65%) in the year 2017.

V. Citizen Survey Data

Figure 5: Type of Facilities used by the citizens across different Socio-Economic Classes (SEC), 2017[28]
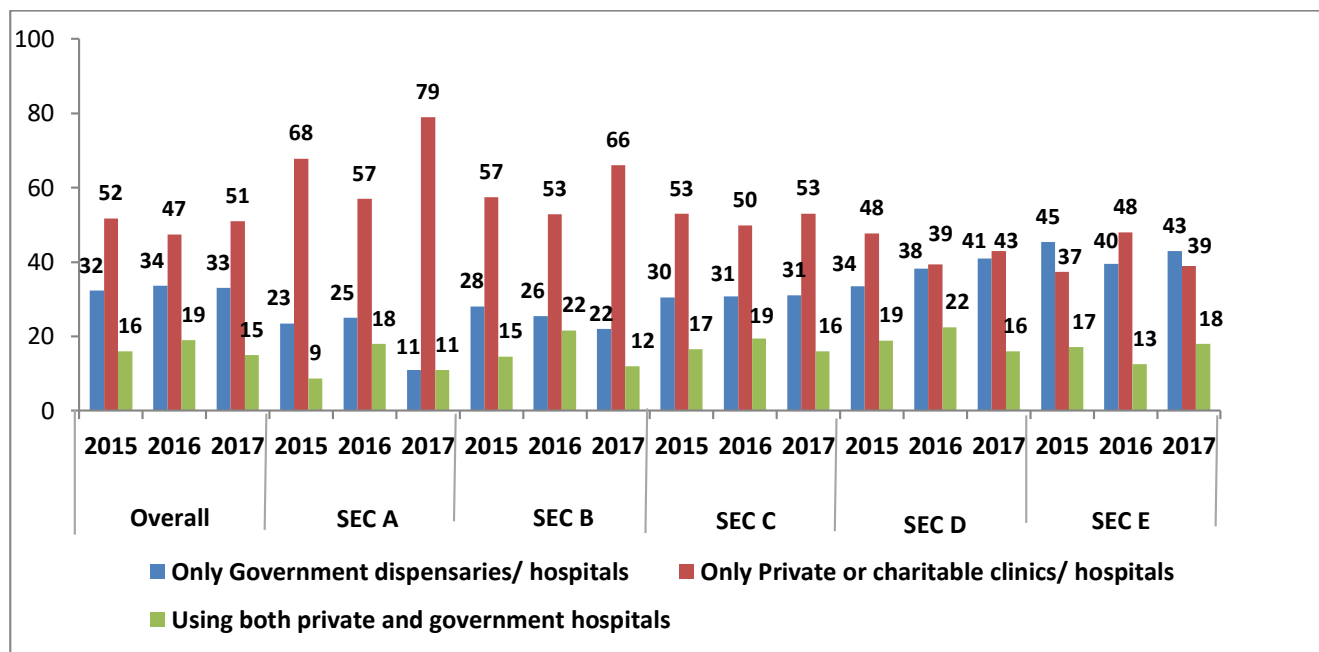
In 2017, 51% households accessed private or charitable clinic/hospitals from the overall SECs. On the other hand, in the same year only 33% households had accessed government dispensaries/hospitals

28 As of March 2016

Figure 6: Estimated percentage of Annual Family Income spent on hospital/medical costs across Socio-Economic Classes (SEC)[29]
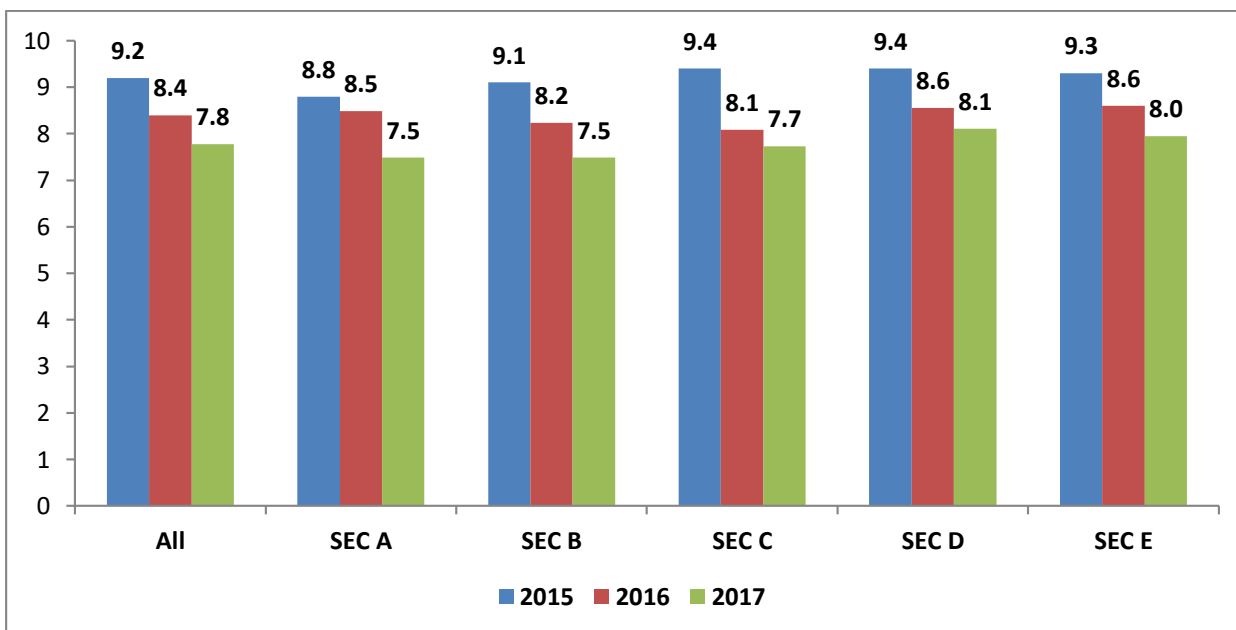
The percentage of annual family income spent on hospital/ medical expenses has gone down across SECs from 2015 to 2017. Estimated annual income spent on hospital/medical costs was 7.8% across all SECs in 2017.

Figure 7: Medical Insurance across Socio-Economic Classes' family with no Medical Insurance
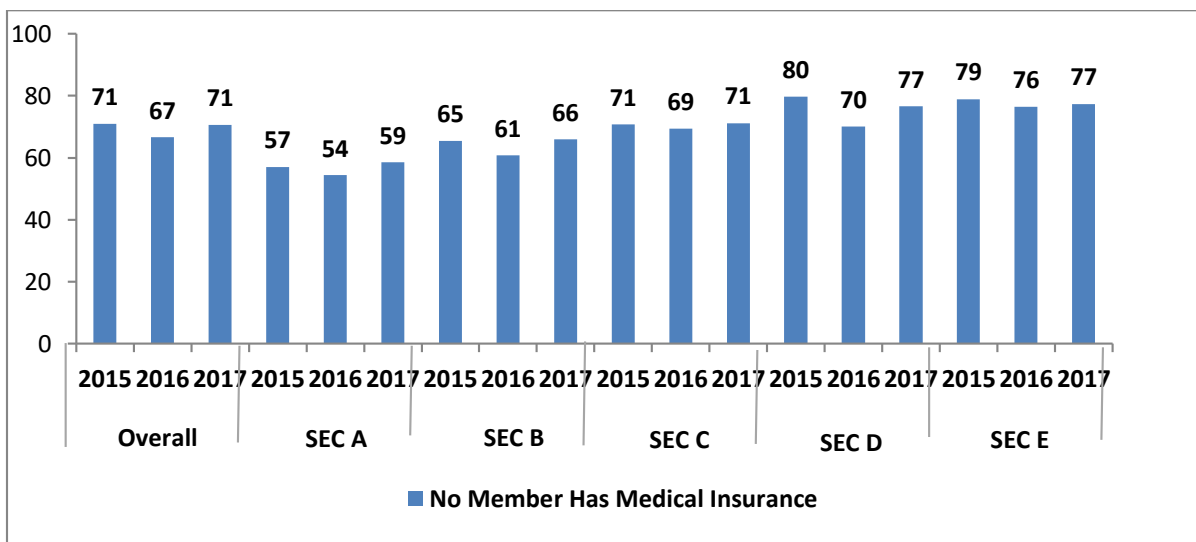
There has been little to no fluctuation in the number of families with no medical insurance from 2015,2016 and 2017. Incidentally the fluctuation has been on the higher percentage side with 71% being the average.

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29 Refer Annexure 3 for Socio-Economic Classification

Figure 8: Estimated percentage of Annual Family Income spent on hospital/medical costs across Socio-Economic Classes

Legend: ■ More than 11% ■ 6% to 10% ■ Less than 5%

	SEC A			SEC B			SEC C			SEC D			SEC E		
Year	2015	2016	2017	2015	2016	2017	2015	2016	2017	2015	2016	2017	2015	2016	2017
Less than 5%	42	43	56	41	47	56	44	51	53	44	48	55	44	47	56
6% to 10%	40	41	34	40	38	33	34	35	35	35	35	31	35	37	31
More than 11%	18	16	10	19	15	10	22	14	11	21	16	14	21	16	13
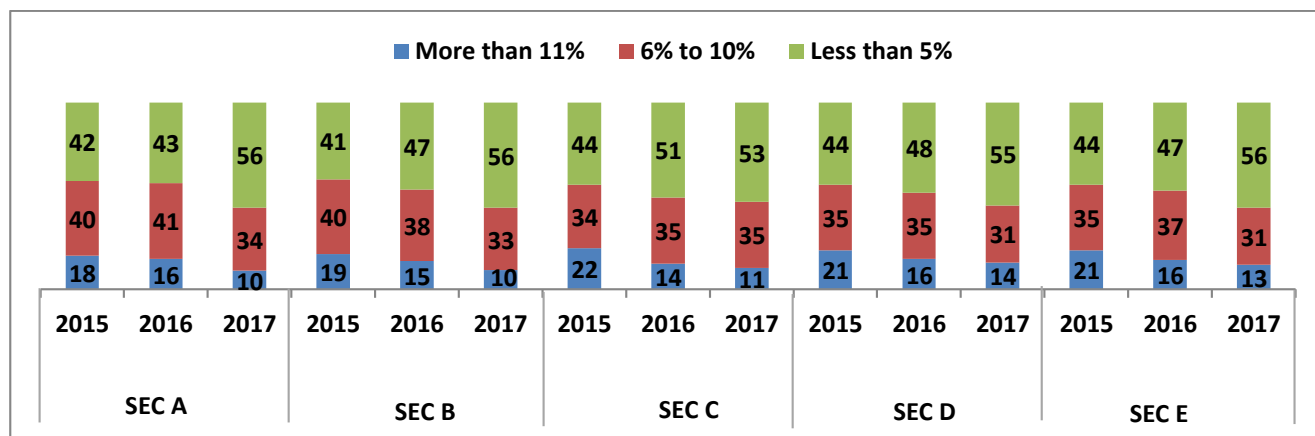
Percentage of households spending more than 11% of their annual family income on hospital/ medical costs has seen a drop across SECs except for SEC D and SEC E where it is slightly above 11% i.e. 14% and 13% respectively.

Table 15: Data shown in below table is as per, per capita income from 2016-17

2014-15		2015-16		2016-17	
Annual Per Capita Income in Mumbai	Rs. 2,49,992[30]	Annual Per Capita Income in Mumbai	Rs. 2,71,046[31]	Annual Per Capita Income in Mumbai	Rs. 2,96,208[32]
Less 25% (accounting for savings and taxation)	Rs. 1,87,494	Less 25% (accounting for savings and taxation)	Rs. 1,66,617	Less 25% (accounting for savings and taxation)	Rs. 2,22,156
Annual Income per household = Per Capita X 4.58	Rs. 8,58,723	Annual Income per household = Per Capita X 4.58	Rs. 7,63,106	Annual Income per household = Per Capita X 4.58	Rs. 10,17,474
Annual Expenditure on Health per household = 9.2%	Rs. 79,002	Annual Expenditure on Health per household = 8.4%	Rs. 64,101	Annual Expenditure on Health per household = 7.8%	Rs. 79,363
Overall Household Annual Expenditure on Health = Rs. 79,002/- X 2,830,000	Rs. 22,358 crores	Overall Household Annual Expenditure on Health = Rs. 64,101/- X 2,830,000	Rs.18,141 crores	Overall Household Annual Expenditure on Health = Rs. 79,363/- X 2,830,000	Rs. 22,460 crores

As per the Economic Survey of Maharashtra, 2016-17, people intimated that annually the average spent on medical costs was 7.8% of their family income. Therefore, the above table translates into Rs 22,460 Crores spent on hospital/medical costs in Mumbai.

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30 31 32 Gross value added as per the Economic Survey of Maharashtra 2016-17 for the years 2015-16, 2014-15 and 2013-14 respectively. The directorate of Economics and statistics revised the Gross value added and the above numbers.

Table 16: Estimated cases per 1000 households of Diseases and Ailments across different Socio-Economic Classes in 2017

Diseases & Ailments	Malaria	Dengue	Diabetes	Cancer	TB	Diarrhoea	Chikungunya	Hypertension
Overall	40	33	49	5	10	2	12	26
SEC A	27	33	42	1	4	1	6	21
SEC B	29	23	50	3	5	1	5	26
SEC C	33	28	45	4	9	1	7	23
SEC D	45	29	65	4	14	4	15	24
SEC E	66	39	36	12	14	0	29	35

It can be seen that SEC E is most affected with Malaria (66), Dengue (39), cancer (12), TB (14), Chikungunya (29) and Hypertension (35).

Table 17: Gender and Age-wise estimated cases per 1000 households of Diseases and Ailments across different socio-economic classes year 2017

Diseases and Ailments	Total Estimated Cases					
	Overall	Males	Females	18 - 25 years	26 - 40 years	40+ years
Malaria	40	47	41	50	10	19
Diabetes	49	45	54	2	13	135
Hypertension	26	22	31	2	15	57
Tuberculosis	10	8	12	13	2	6
Diarrhoea	2	1	2	1	2	1
Cancer	5	3	7	1	1	11
Dengue	33	37	25	32	3	16
Chikungunya	12	10	19	7	7	19

In the cases of both dengue and malaria, there is a significant proportion of population aged 18-25 years.

Table 18: Type of Facilities used by the citizens by diseases per 1000 households

	Year	Malaria	Dengue	Chikungunya	Cancer	Tuberculosis
Only Government dispensaries/ hospitals	*2015*	40	24	34	27	49
	2016	36	37	32	58	48
	2017	44	31	53	58	52
Only Private or Charitable clinics/ hospitals	*2015*	47	63	56	36	31
	2016	38	49	56	21	31
	2017	51	66	39	32	42
Using both private and government hospitals	*2015*	13	13	11	37	21
	2016	26	15	12	21	21
	2017	5	3	8	9	6

Table 19: Number of Members who have visited Government and Private hospitals

	Malaria	Dengue
Only Government dispensaries/ hospitals	39,811	33,653
Only Private or Charitable clinics/ hospitals	46,104	72,343
Using both private and government hospitals	4,788	3,447
Total	**90,703**	**1,09,443**

The information received under RTI from various government institutions shows that dengue cases in Mumbai were 17,771 & 11,607 of dengue and malaria respectively while the survey data across all 24 wards of Mumbai showed that the cases of dengue were as high as 1,09,443 and cases of malaria were 90,703.

VI. Deliberations by Municipal Councillors and MLAs on Health Issues

Table 20: Total numbers of Meeting, Attendance and Questions from March'12 to March'17

Public Health Committee	Total Meetings	Attendance (%)	Total Questions Asked
March 2012 to March 2013	16	68	56
April 2013 to March 2014	17	68	122
April 2014 to March 2015	24	61	123
April 2015 to March 2016	18	64	147
April 2016 to March 2017	20	60	131

The number of Public Health Committee meetings held in 2016-17 have increased while the attendance in 2016-17 has decreased compared to 2015-16.

Table 21: Health issues raised by Public Health Committee Councillors from March'12 to March'17

Issues	Question asked				
	March 2012 to March 2013	April 2013 to March 2014	April 2014 to March 2015	April 2015 to March 2016	April 2016 to March 2017
Budget	0	0	0	0	1
Cemeteries /Crematorium related	3	1	4	3	1
Epidemic/Sensitive Diseases	2	2	7	15	12
Malaria/Dengue	3	7	3	14	6
Diabetic/Hypertension	0	2	0	0	0
Diarrhoea/Typhoid/Cholera	1	0	0	0	0
Tuberculosis	0	1	0	1	3
Dispensary/Municipal Hospital/State Hospital	0	0	0	3	5
Equipment's	8	2	11	9	11
Eradication programme	0	1	0	0	2
Fogging	0	0	1	0	1
Health Education/institute	0	1	1	3	2
Health Service Related	12	32	14	6	11
Human Resource	10	31	17	22	23
Health Infrastructure	2	11	18	28	29
Issue of Birth/Death certificates	2	0	1	2	1
License	1	2	1	1	3
Maternity homes / Primary Health Centre(PHC)	2	6	4	8	1
MCGM Related	1	1	2	5	7
Mortality rate	0	1	0	0	0
Medical Examination of Students	0	0	0	2	0
Naming/ Renaming Hospital/Health Centre/Cemeteries	2	4	4	7	5
Nuisance due to stray dogs, monkeys etc.	1	0	1	0	1
Pest Control Related	0	0	3	0	0
Private Health Services	0	0	0	3	1
Quacks	0	1	0	2	1
Schemes / Policies in Health	4	17	20	15	5
Social Cultural Concerns Related	0	0	6	0	0
Treatment/Medicines	6	9	8	13	8
Total	**56**	**122**	**123**	**147**	**131**

The number of issues raised by councillors in Health Committee meetings has decreased from 147 in 2015-16 to 131 in 2016-17. The highest number of issues was raised on health infrastructure (29) in 2017 while no issues were raised on diarrhoea and only four issues were raised on tuberculosis from April 2014-March 2017

Table 22 : Number of questions asked on Health by Municipal Councillors ward-wise in All Committees from April 2012 to March 2017

Ward	No. of Councillors	April 2012 to March 2013	April 2013 to March 2014	April 2014 to March 2015	April 2015 to March 2016	April 2016 to March 2017
A	4	0	1	2	11	19
B	3	0	1	1	3	2
C	4	0	3	5	0	1
D	7	3	8	9	7	4
E	8	6	11	13	8	4
F/N	10	5	6	14	13	8
F/S	7	9	4	8	4	12
G/N	11	8	4	7	7	12
G/S	9	18	14	8	13	11
H/E	11	8	10	10	21	12
H/W	6	1	2	2	5	1
K/E	15	11	10	11	12	10
K/W	13	13	12	11	7	15
L	15	50	100	122	97	99
M/E	13	5	26	26	13	8
M/W	8	6	13	13	10	13
N	12	6	8	15	18	9
P/N	16	11	35	48	21	20
P/S	8	4	7	8	22	14
R/C	10	8	11	8	11	13
R/N	7	5	29	26	36	21
R/S	11	14	34	30	42	34
S	13	8	12	9	24	14
T	6	1	4	11	7	9
Total	**227**	**200**	**365**	**417**	**412**	**365**

Municipal councillors in wards B, C, D, E and H/W asked less than five questions during the year 2016-17. More number of questions were raised from L ward accounting to 27% of the total number of questions raised.

Table 23: Health issues raised by Municipal Councillors from March'12 to March'2017

Issues	Question asked				
	April 2012 to March 2013	April 2013 to March 2014	April 2014 to March 2015	April 2015 to March 2016	April 2016 to March 2017
Budget	0	1	0	1	1
Bio medical Waste	0	0	1	1	9
Cemeteries / Crematorium related	21	17	22	9	6
Compensation/Rehabilitation	0	0	0	1	1
Epidemic/Sensitive Diseases	*28*	*51*	*84*	*97*	*87*
Malaria/Dengue	*16*	*20*	*46*	*43*	*40*
Tuberculosis	*0*	*6*	*22*	*11*	*6*
Diarrhoea/Typhoid/Cholera	*1*	*1*	*0*	*2*	*0*
Diabetes/Hypertension	*0*	*1*	*2*	*4*	*1*
Dispensary/Municipal Hospital/State Hospital	0	0	0	7	5
Equipment's	12	10	17	13	15
Eradication programme	1	1	1	3	2
Fogging	10	17	23	5	13
Health Related Issues	7	13	37	32	42
Human Resource	23	61	40	43	38
Health Services	23	47	36	16	19
Health Education/Institute Related	0	4	3	5	9
Infrastructure	9	22	37	60	44
Issue of Birth/Death certificates	4	7	4	4	4
License Related	1	1	4	12	5
Medical Examination Report	0	0	0	2	0
Maternity homes / Primary Health Centre(PHC)	9	26	11	15	11
MCGM related	1	5	3	6	7
Mortality rate	1	1	1	0	0
Naming/ Renaming Hospital/Health Centre/Cemeteries	11	16	21	11	9
Nuisance due to Pest Rodents, stray dogs, monkeys etc.	1	0	5	1	1
Negligence of officers	0	0	0	2	1
Private health services	2	7	2	4	3
Quacks	0	1	0	2	1
Schemes / Policies in Health	23	46	50	41	21
Vaccination	0	0	0	2	0
Treatment/Medicines	13	11	15	17	11
Total	**200**	**365**	**417**	**412**	**365**

Total number of questions asked by municipal councillors on health issues was 365 in 2016-17, which has decreased compared to 2015-16 when the number of questions raised was 412. Only one question was asked on mortality rate and only two questions were asked on diarrhoea in last three years.

Table 24: Health issues raised by MLAs from following sessions: Monsoon Sessions 2015, Winter sessions 2015 and Budget sessions 2016

Issues	Que. related to Mumbai & Schemes/Policies	Other Health Questions	Total Health Que
Bio Medical Waste	1	3	4
Budget	1	0	1
Cemeteries/Crematorium related	15	2	17
Epidemic/Sensitive Diseases	74	73	147
Diabetic/Hypertension	*0*	*1*	*1*
Malaria/Dengue	*12*	*28*	*40*
Diarrhoea/Typhoid/Cholera	*7*	*3*	*10*
Tuberculosis	*10*	*1*	*11*
Compensation/Rehabilitation	1	0	1
Dispensary/Municipal Hospital/State Hospital	7	10	17
Equipment's	9	13	22
Eradication programme	6	0	6
Food Poison	8	3	11
Health Education/Institute	5	17	22
Health Insurance	4	2	6
Health Related Issues	34	42	76
Health Service Related	30	15	45
Human Resource	16	73	89
Infrastructure	31	40	71
License	3	2	5
Maternity homes / Primary Health Centre(PHC)	2	10	12
Medical Examination of Students	1	2	3
Mortality Rate	4	43	47
Pollution	1	7	8
Private Health Services	2	3	5
Quacks	0	7	7
Schemes / Policies in Health	51	0	51
Treatment/Medicines	19	88	107
Total	**325**	**455**	**780**

Table 25: Questions asked on health issues by MLAs from: Monsoon Sessions 2015, Winter Sessions 2015 & Budget Session 2016

Constituency No.	Name of MLA	Party	Area	Que. related to Mumbai & Schemes/Policies	Other Health Que.	Total Health Que
153	Manisha Chaudhari	BJP	Dahisar	7	22	29
154	Prakash Surve	SS	Magathane	11	2	13
155	Sardar Tara Singh	BJP	Mulund	8	22	30
156	Sunil Rajaram Raut	SS	Vikhroli	11	9	20
157	Ashok Patil	SS	Bhandup West	4	1	5
159	Sunil Prabhu	SS	Dindoshi	11	18	29
160	Atul Bhatkhalkar	BJP	Kandivali East	8	17	25
161	Yogesh Sagar	BJP	Charkop	11	24	35
162	Aslam Shaikh	INC	Malad West	47	67	114
164	Bharati Lavekar	BJP	Versova	0	0	0
165	Ameet Satam	BJP	Andheri West	5	4	9
166	Ramesh Latke	SS	Andheri East	0	0	0
167	Parag Alavani	BJP	Vile Parle	9	12	21
168	Md. Arif (Naseem) Khan	INC	Chandivali	17	16	33
169	Ram Kadam	BJP	Ghatkopar West	0	0	0
171	Abu Azmi	SP	Mankhurd shivaji Nagar	8	9	17
172	Tukaram Kate	SS	Anushakti Nagar	5	0	5
173	Prakash Phaterpekar	SS	Chembur	3	4	7
174	Mangesh Kudalkar	SS	Kurla	0	2	2
175	Sanjay Potnis	SS	Kalina	11	6	17
176	Trupti Sawant	SS	Vandre (East)	2	5	7
177	Ashish Shelar	BJP	Vandre West	11	25	36
178	Varsha Gaikwad	INC	Dharavi	17	16	33
179	Captain R. Tamil Selvan	BJP	Sion Koliwada	0	0	0
180	Kalidas Kolambkar	INC	Wadala	20	17	37
181	Sada Sarvankar	SS	Mahim	6	6	12
182	Sunil Shinde	SS	Worli	7	13	20
183	Ajay Choudhari	SS	Shivadi	11	12	23
184	Waris Pathan	AIMEIM	Byculla	3	5	8
185	Mangal Prabhat Lodha	BJP	Malabar Hill	2	7	9
186	Amin Patel	INC	Mumbadevi	67	107	174
187	Raj K. Purohit	BJP	Colaba	3	7	10
	Total			**325**	**455**	**780**

Captain R. Tamil Selvan, Ram Kadam and Bharati Hemant Lavekar have asked zero questions in all Monsoon Sessions 2015, Winter Sessions 2015 & Budget Session 2016.

VII. Ward-wise Occurrence of Diseases

Table 26: Estimated proportion of usage of various Dispensaries/Hospitals from April'2016 to March'2017

Ward	Provisional Population 2011	No. of Government Hospitals	Available Government Dispensaries	Density of government dispensaries to population
A	185,014	4	7	26,431
B	127,290	0	5	25,458
C	166,161	0	5	33,232
D	346,866	0	8	43,358
E	393,286	6	13	32,774
F/N	529,034	3	7	75,576
F/S	360,972	3	9	40,108
G/N	599,039	0	10	59,904
G/S	377,749	1	14	26,982
H/E	557,239	1	8	69,655
H/W	307,581	1	5	61,516
K/E	823,885	1	12	68,657
K/W	748,688	1	7	106,955
L	902,225	1	14	64,445
M/E	807,720	1	9	89,747
M/W	411,893	1	5	82,379
N	622,853	3	8	77,857
P/N	941,366	3	10	94,137
P/S	463,507	2	2	231,754
R/C	562,162	1	6	93,694
R/N	431,368	1	4	107,842
R/S	691,229	2	6	115,205
S	743,783	0	7	106,255
T	341,463	3	3	113,821
Total	**12,442,373**	**39**	**184**	**67,991**

Table 27: Ward wise Malaria Data

Ward[33]	Population 2011	2012-13	2013-14	2014-15	2015-16	2016-17
A	1,85,014	602	303	183	156	139
B	1,27,290	99	33	31	25	31
C	1,66,161	162	113	92	97	76
D	3,46,866	112	100	90	94	67
E	3,93,286	213	160	89	44	93
F/N	5,29,034	362	238	176	168	152
F/S	3,60,972	846	568	960	812	441
G/N	5,99,039	312	310	272	141	162
G/S	3,77,749	201	100	64	76	150
H/E	5,57,239	223	179	186	114	152
H/W	3,07,581	170	205	177	121	125
K/E	8,23,885	831	381	368	315	172
K/W	7,48,688	308	205	132	133	170
L	9,02,225	512	386	285	232	145
M/E	8,07,720	178	112	149	87	209
M/W	4,11,893	131	78	53	58	37
N	6,22,853	353	228	186	130	102
P/N	9,41,366	104	83	79	127	153
P/S	4,63,507	56	43	54	42	29
R/C	5,62,162	106	84	103	97	89
R/N	4,31,368	88	73	78	90	52
R/S	6,91,229	230	130	99	88	107
S	7,43,783	162	137	117	128	122
T	3,41,463	154	79	37	42	52
Municipal Hospital		12408	11918	9961	9150	6741
State Hospital		1280	1052	854	1233	1312
Other Government Hospital		1736	1100	808	831	527
Total	**1,24,42,373**	**21939**	**18398**	**15683**	**14631**	**11607**

- Malaria cases have reduced by 47% from 2012-13 to 2016-17.
- In the last 5 consecutive years, F/S and K/E has been amongst the highest in malaria occurrences.
- F/S (441), M/E (209) and K/E (172) have the highest number of malaria cases in the year 2016-17.

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[33] Data for dispensaries has been obtained ward wise from the Medical Officer of Health (MOH) of all 24 wards of MCGM.

Table 28: Ward wise Dengue Data

Ward[34]	Population 2011	2012-13	2013-14	2014-15	2015-16	2016-17
A	1,85,014	0	0	47	137	42
B	1,27,290	0	27	51	43	25
C	1,66,161	0	3	17	14	26
D	3,46,866	0	0	35	60	84
E	3,93,286	0	1	25	42	3
F/N	5,29,034	3	2	54	29	35
F/S	3,60,972	0	0	34	22	11
G/N	5,99,039	0	10	64	35	21
G/S	3,77,749	0	0	0	1	9
H/E	5,57,239	1	0	22	67	1
H/W	3,07,581	0	3	11	13	16
K/E	8,23,885	16	29	67	198	224
K/W	7,48,688	0	3	35	12	0
L	9,02,225	0	12	11	43	144
M/E	8,07,720	0	0	24	2	0
M/W	4,11,893	1	14	4	2	27
N	6,22,853	1	2	38	155	70
P/N	9,41,366	0	0	12	56	3
P/S	4,63,507	1	11	2	15	3
R/C	5,62,162	0	0	19	31	53
R/N	4,31,368	0	0	26	132	108
R/S	6,91,229	2	24	81	30	39
S	7,43,783	1	0	28	308	95
T	3,41,463	0	6	1	4	0
Municipal Hospital		4441	5952	7710	11484	13323
State Hospital		289	732	1523	1776	2529
Other Government Hospital		111	430	358	533	880
Total	**1,24,42,373**	**4867**	**7261**	**10299**	**15244**	**17771**

- Reporting of Dengue cases has increased three times in L ward from 43 in 2015-16 to 144 in 2016-17.
- From the last five years (2012-13 to 2016- 17) the overall dengue occurrences have increased by **265%.**

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[34] Data for dispensaries has been obtained ward wise from the Medical Officer of Health (MOH) of all 24 wards of MCGM.

Table 29: Positive dengue cases as per rapid kit test

Ward	Dengue Cases in Dispensary	2016-17 - Dengue Positive Cases
A	42	51
B	25	6
C	26	26
D	82	73
E	3	18
F/N	33	79
F/S	11	31
G/N	12	62
G/S	9	176
H/E	1	20
H/W	16	29
K/E	182	179
K/W	0	5
L	124	134
M/E	0	41
M/W	27	0
N	70	76
P/N	3	30
P/S	3	5
R/C	53	38
R/N	108	96
R/S	0	38
S	95	105
T	0	3
Total	**925**	**1321**

H/E ward, M/E and R/S wards had stated dengue cases in their wards were one, zero and zero respectively. However, the results of Rapid Test Kits showed the number of positive dengue cases as 20, 41 and 38 cases in these wards respectively.

Table 30: Ward wise Tuberculosis Data

Ward[35]	Population 2011	2012-13	2013-14	2014-15	2015-16	2016-17
A	1,85,014	342	452	369	274	238
B	1,27,290	117	110	121	95	252
C	1,66,161	120	115	141	134	73
D	3,46,866	250	237	233	234	201
E	3,93,286	748	572	561	408	376
F/N	5,29,034	382	255	307	375	161
F/S	3,60,972	185	14	438	239	176
G/N	5,99,039	457	510	396	444	434
G/S	3,77,749	178	174	198	402	229
H/E	5,57,239	539	485	549	532	659
H/W	3,07,581	757	245	237	236	205
K/E	8,23,885	1069	616	663	491	327
K/W	7,48,688	398	292	264	242	162
L	9,02,225	994	1037	1182	1422	1254
M/E	8,07,720	135	228	102	82	148
M/W	4,11,893	111	282	136	165	95
N	6,22,853	140	143	203	158	143
P/N	9,41,366	120	200	238	219	310
P/S	4,63,507	58	97	48	43	21
R/C	5,62,162	183	206	180	188	195
R/N	4,31,368	98	103	118	158	201
R/S	6,91,229	613	611	532	411	493
S	7,43,783	440	675	485	448	369
T	3,41,463	246	216	386	200	108
Municipal Hospital		26198	31782	32439	31463	40849
State Hospital		946	1216	1829	1645	1890
Other Government Hospital		593	606	482	464	432
Total	1,24,42,373	36417	41479	42837	41172	50001

- From 2012-13 to 2016-17, L ward has seen one of the highest occurrence for tuberculosis. In 2016-2017, the total number of occurrences is 1,254
- From 2012-13 to 2016-17, there has been a 37% increase in the occurrences of tuberculosis.

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[35] Data for dispensaries has been obtained ward wise from the Medical Officer of Health (MOH) of all 24 wards of MCGM.

Table 31: Ward wise Diabetes Data

Ward[36]	Population 2011	2012-13	2013-14	2014-15	2015-16	2016-17
A	1,85,014	327	493	449	433	639
B	1,27,290	756	447	439	759	823
C	1,66,161	47	149	115	151	334
D	3,46,866	413	293	277	2034	2058
E	3,93,286	327	600	411	704	936
F/N	5,29,034	618	505	1113	821	807
F/S	3,60,972	216	81	68	169	302
G/N	5,99,039	1068	1247	1963	2687	1470
G/S	3,77,749	168	197	158	333	619
H/E	5,57,239	220	409	273	668	1157
H/W	3,07,581	168	248	101	215	148
K/E	8,23,885	1770	1972	1018	1008	1134
K/W	7,48,688	1146	1760	1105	569	1700
L	9,02,225	1402	1222	878	1592	1175
M/E	8,07,720	592	448	606	1699	1805
M/W	4,11,893	303	267	178	222	268
N	6,22,853	579	715	558	573	2353
P/N	9,41,366	155	176	132	582	494
P/S	4,63,507	311	272	107	143	125
R/C	5,62,162	367	324	201	560	1333
R/N	4,31,368	78	135	129	1158	387
R/S	6,91,229	2420	5390	7540	831	1512
S	7,43,783	586	858	329	1710	1154
T	3,41,463	177	291	239	99	127
Municipal Hospital		7424	18901	27319	4898	4605
State Hospital		728	742	1135	832	957
Other Government Hospital		2579	2699	1869	5246	4098
Total	**1,24,42,373**	**24945**	**40841**	**48710**	**30696**	**32520**

N and D wards show the highest number of diabetes cases with 2,353 and 2,058 respectively. The least cases of diabetes were reported from P/S ward with 125 cases.

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[36] Data for dispensaries has been obtained ward wise from the Medical Officer of Health (MOH) of all 24 wards of MCGM.

Table 32: Ward wise Diarrhoea Data

Ward[37]	Population 2011	2012-13	2013-14	2014-15	2015-16	2016-17
A	1,85,014	1449	2002	2092	1620	1310
B	1,27,290	1077	1545	1783	1766	870
C	1,66,161	1946	2431	3085	2972	2630
D	3,46,866	4649	4865	5302	6510	6927
E	3,93,286	2208	2474	2758	3414	2848
F/N	5,29,034	1547	1507	1695	1837	2500
F/S	3,60,972	4259	4120	3634	4085	4827
G/N	5,99,039	3073	2881	2923	3553	5673
G/S	3,77,749	4036	4691	4792	5387	5659
H/E	5,57,239	4224	6006	6884	7368	6396
H/W	3,07,581	1878	2028	2104	2204	1522
K/E	8,23,885	6641	7169	10428	7970	5841
K/W	7,48,688	3011	3792	2774	2325	1724
L	9,02,225	11967	9659	10143	12311	11535
M/E	8,07,720	2565	3248	5894	11805	4908
M/W	4,11,893	2656	2262	1856	1918	1896
N	6,22,853	5972	7079	8140	10239	8121
P/N	9,41,366	2790	3582	2911	3384	3415
P/S	4,63,507	949	1073	949	692	658
R/C	5,62,162	2633	3454	3851	3599	2576
R/N	4,31,368	580	785	823	2329	1836
R/S	6,91,229	1925	1375	1606	1625	1674
S	7,43,783	3822	3507	4108	5070	4322
T	3,41,463	3252	2534	2067	3052	1873
Municipal Hospital		19358	31718	21857	9677	6947
State Hospital		785	1561	1129	1741	1162
Other Government Hospital		575	832	1169	889	993
Total	**1,24,42,373**	**99827**	**118180**	**116757**	**119342**	**100643**

Diarrhoea cases have increased consistently in D ward in last 5 years, with 6,927 cases in 2016-17 compared to 4,649 in 2012-13. L ward, which comprises of Kurla, has the highest number of diarrhoea cases.

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[37] Data for dispensaries has been obtained ward wise from the Medical Officer of Health (MOH) of all 24 wards of MCGM.

Table 33: Ward wise Hypertension Data

Ward[38]	Population 2011	2012-13	2013-14	2014-15	2015-16	2016-17
A	1,85,014	1225	1492	1409	1170	1658
B	1,27,290	679	493	245	335	408
C	1,66,161	57	197	479	526	440
D	3,46,866	359	306	394	2309	2326
E	3,93,286	1079	896	447	1466	1718
F/N	5,29,034	1121	1247	1276	1664	1580
F/S	3,60,972	768	215	161	299	576
G/N	5,99,039	937	1335	1507	2006	2070
G/S	3,77,749	469	390	343	645	654
H/E	5,57,239	386	562	474	1381	1327
H/W	3,07,581	285	226	88	181	136
K/E	8,23,885	2102	1990	1344	1945	1663
K/W	7,48,688	804	1398	1417	1122	2744
L	9,02,225	1365	1464	2185	2016	1441
M/E	8,07,720	1010	691	688	1559	1874
M/W	4,11,893	684	503	244	264	254
N	6,22,853	596	709	683	646	992
P/N	9,41,366	199	258	91	327	427
P/S	4,63,507	274	235	121	130	97
R/C	5,62,162	1122	735	586	896	1293
R/N	4,31,368	61	203	142	601	258
R/S	6,91,229	1522	2582	3181	966	1362
S	7,43,783	435	540	509	1035	1387
T	3,41,463	207	206	228	290	224
Municipal Hospital		6844	12182	17390	5048	4615
State Hospital		921	821	1039	865	1199
Other Government Hospital		3213	3761	1999	6269	4034
Total	1,24,42,373	28724	35637	38670	35961	36757

Wards K/W (2,744), D (2,326) and G/N (2,070) are the wards, having the maximum number of hypertension cases.

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[38] Data for dispensaries has been obtained ward wise from the Medical Officer of Health (MOH) of all 24 wards of MCGM.

Annexure 1 –List of Government dispensaries/hospitals

Sr. No.	Government Hospitals	Sr. No.	Government Hospitals
1	Central Railway Hospital	5	E.S.I.S. Hospital, Worli
2	Port Trust Hospital, Wadala	6	E.S.I.S. Hospital, Mulund
3	Nagpada Police Hospital	7	E.S.I.S. Hospital, Kandivali
4	Naigaon Police Hospital	8	ESIC Model Hospital, Marol

Sr. No.	Police Dispensaries	Sr. No.	Police Dispensaries
1	Police Headquarters Awar Dispensary	7	Santacruz Police Dispensary
2	Police Dispensary, Tardeo	8	Andheri Police Dispensary
3	Dr. D.B. Marg Police Dispensary	9	Marol Police Dispensary
4	Dadar Police Dispensary	10	Kandivali Police Dispensary
5	LA-II HQ Police Dispensary, Worli	11	Police Dispensary, Neharu Nagar
6	Mahim Police Dispensary	12	Pant Nagar Dispensary

Sr. No.	Municipal Hospitals	Sr. No.	Municipal Hospitals
1	B.Y. L. Nair Charitable Hospital	14	M.W. Desai Hospital
2	Acworth Municipal Hospital	15	Maa Hospital, Diwalabai Mohanlal Mehta Hospital
3	Centenary Hospital, Govandi	16	Mahatma Jyotiba Phule Hospital
4	Dr. Babasaheb Ambedkar Hospital Kandivali (W) (Centenary Hospital)	17	Municipal Group of T.B. Hospital
5	Dr. R.N. Cooper Hospital	18	S. V. D. Sawarkar Hospital
6	E.N.T Hospital	19	S.K Patil Hospital
7	Eye Hospital	20	Sant Muktabai Hospital
8	K. B. Bhabha Hospital, Bandra	21	Seth V.C. Gandhi & M. A. Vora Rajawadi Hospital
9	K.B. Bhabha Hospital	22	Shri Harilal Bhagwati Hospital
10	Kasturba Hospital	23	Siddarth Hospital
11	Kasturba X (Cross) Road Hospital (Borivali)	24	Smt. Mansadevi T. Agarwal Hospital
12	King Edward Memorial Hospital	25	Trauma Care Hospital Jogeshwari East
13	Lokmanya Tilak Hospital	26	V. N. Desai Hospital

Sr. No.	State Hospitals	Sr. No.	State Hospitals
1	Gokuldas Tejpal Hospital	4	St. George's Hospital
2	Cama and Albless Hospital	5	General Hospital (Malwani)
3	Sir J.J. Group of Hospitals		

Sr. No.	Ward	Municipal Dispensaries	Sr. No.	Ward	Municipal Dispensaries
1	A	Colaba Municipal Dispensary	89	K/E	Natwar Nagar Dispensary
2	A	Head Office (H.O.) Dispensary	90	K/E	Paranjape Dispensary

Sr. No.	Ward	Municipal Dispensaries	Sr. No.	Ward	Municipal Dispensaries
3	A	Maruti Lane Dispensary	91	K/E	Sambhaji Nagar Dispensary
4	A	Saboo Siddhique Road Dispensary, Paltan Road (S.S. Road)	92	K/E	Sambhji Nagar Ayurvedic Dispensary
5	A	Shahid Bhagat Singh Road Dispensary	93	K/E	Sunder Nagar Dispensary*
6	A	Ayurvedic Head Office (H.O.) Dispensary	94	K/W	Banana Leaf Dispensary*
7	B	Jail Road municipal Dispensary	95	K/W	Juhu Dispensary
8	B	Jail Road Unani Dispensary	96	K/W	Millat Nagar Dispensary*
9	B	Kolsa Mohalla Unani Dispensary	97	K/W	N.J. Wadiya Dispensary
10	B	S.V.P. Road Municipal Dispensary	98	K/W	Oshivara Dispensary
11	B	Walpakhadi Muncipal Dispensary	99	K/W	Vileparle Market Dispensary
12	C	Chandanwadi Dispensary	100	K/W	Vrasova Dispensary
13	C	Duncan Road Dispensary	101	L	Asalpha Village Dispensary
14	C	Ghogari Mohalla Dispensary	102	L	Bail Bazar Mun. Dispensary
15	C	Panjarapol Mun. Dispensary	103	L	Budda Colony Dispensary
16	C	Thakurdwar Dispensary	104	L	Chandivali M.N.P. Dispensary
17	D	Banganga Municipal Dispensary	105	L	Christain Municipal Dispensary*
18	D	Nana Chowk Dispensary	106	L	Chunnabhatti Dispensary
19	D	R.S. Nimkar Marg Dispensary	107	L	Himalaya Society Municipal Dispensary*
20	D	Raja Rammohan Roy Marg Dispensary (R.R.R Marg)	108	L	Kajupada Muncipal Dispensary
21	D	Tardeo Flat Municipal Dispensary	109	L	Mohill Village Dispensary
22	D	Tulsiwadi Dispensary (Bane Compound)	110	L	Nehru Nagar Dispensary
23	E	D.P.Wadi Municipal Dispensary	111	L	Qureshi Nagar Dispensary
24	E	ES Pathanwala Municipal Dispensary	112	L	Safad Pool Dispensary
25	E	Gaurabhai Dispensary	113	L	Tilak Nagar Dispensary
26	E	Huzaria Street Dispensary	114	M/E	Anik Nagar Dispensary*
27	E	Motishah Dispensary	115	M/E	Ayodhya Nagar Dispensary
28	E	N.M. Joshi Marg Dispensary	116	M/E	Deonar Colony Dispensary
29	E	Nawab Tank Municipal Dispensary	117	M/E	Gavanpada Dispensary
30	E	R.J. Compound Dispensary*	118	M/E	Kamala Raman Nagar Municipal Dispensary/Baiganwadi Dispensary
31	E	Siddarth Nagar Dispensary	119	M/E	Lallubhai Compound Municipal Dispensary*
32	E	Souter Street Dispensary*	120	M/E	Maharashtra Nagar Municipal Dispensary
33	E	Tadwadi Municipal Dispensary	121	M/E	R.B.K. International Municipal Dispensary*
34	E	Tank Square Garden Municipal Dispensary	122	M/E	Trombay Municipal Dispensary
35	F/N	Antop Hill Municipal Dispensary	123	M/W	Chembur Colony Dispensary

Sr. No.	Ward	Municipal Dispensaries	Sr. No.	Ward	Municipal Dispensaries
36	F/N	Korba Mithagar Dispensary	124	M/W	Chembur Naka Municipal Dispensary*
37	F/N	L. B. Shastri Dispensary	125	M/W	Labour Camp Dispensary
38	F/N	Raoli Camp Dispensary	126	M/W	Lal Dongar Dispensary
39	F/N	Transit Camp Dispensary*	127	M/W	Mahul Dispensary
40	F/N	Wadala Dispensary	128	N	Kirol Dispensary
41	F/S	A.D. Marg Dispensary	129	N	Pant Nagar Dispensary
42	F/S	Abhyday Nagar Dispensary	130	N	Parksite Dispensary
43	F/S	Ambewadi Dispensary	131	N	Parshiwadi Dispensary
44	F/S	Gautam Nagar Dispensary	132	N	Ramabai Colony Dispensary
45	F/S	Kidwai Nagar Dispensary*	133	N	Sainath Nagar Dispensary
46	F/S	Naigaon Dispensary	134	N	Sarvodaya Pantnagar Dispensary*
47	F/S	Parel Dispensary	135	N	Nath Pai Nagar, Garodia Nagar Dispensary (Started from June 2017)*
48	F/S	Sewree Cross Road Dispensary	136	P/N	Choksey Municipal Dispensary
49	F/S	Triveni Sadan Dispensary	137	P/N	Goshala Municipal Dispensary
50	G/N	Dharavi Main Road Dispensary*	138	P/N	Kurar Village Municipal Dispensary
51	G/N	Dharavi Transit Camp Dispensary	139	P/N	Malvani Municipal Dispensary
52	G/N	Gulbai Dispensary	140	P/N	Manori Dispensary
53	G/N	Kumbharwada Dispensary	141	P/N	Nimani Municipal Dispensary
54	G/N	Matunga Labour camp Dispensary	142	P/N	Pathanwadi Dispensary
55	G/N	Pilla Bunglow Dispensary	143	P/N	Riddhi Garden Mun Dispensary*
56	G/N	Shahu Nagar Dispensary	144	P/N	School Road Municipal Dispensary
57	G/N	Welfare Camp (Shri Cinema) Dispensary	145	P/N	Valnai Municipal Dispensary
58	G/N	Welkarwadi Dispensary	146	P/S	Chincholi Square Garden Dispensary*
59	G/S	B.D.D. Chawl Dispensary	147	P/S	Topiwala Lane Dispensary
60	G/S	Beggar Home Dispensary	148	P/S	Ram Mandir Road, Jogeshwari Dispensary (Purposed)*
61	G/S	Curry Road Dispensary	149	R/C	Charkop Sector 5 Dispensary
62	G/S	Fergusson Road Dispensary	150	R/C	Eksar Road Dispensary*
63	G/S	Jijamata Nagar K. Moses Dispensary	151	R/C	Gorai MHADA Dispensary
64	G/S	Maharashtra High school Compound Dispensary	152	R/C	Gorai Village Dispensary
65	G/S	Prabhadevi Dispensary	123	R/C	K.K. Municipal Dispensary
66	G/S	Prbhadevi Ayurvedic Municipal Dispensary	153	R/C	M.H.B. Dispensary
67	G/S	Sasmira Dispensary	154	R/N	Anand Nagar Municipal Dispensary*

Sr. No.	Ward	Municipal Dispensaries	Sr. No.	Ward	Municipal Dispensaries
68	G/S	Senapati Bapat Marg, Hilly Cross, 633 Dispensary	155	M/W	Chembur Naka Municipal Dispensary*
69	G/S	Welfare Center Dispensary	156	R/N	L.T. Road Dispensary
70	G/S	Worli Koliwada Dispensary*	157	R/N	Shastri Nagar Municipal Dispensary*
71	G/S	Zandu Ayurvedic Mun. Dispensary	158	R/N	Y.R. Tawade Nagar Dispensary*
72	H/E	Bharat Nagar Dispensary	159	R/S	Akurli Road Municipal Dispensary
73	H/E	Jawahar Nagar Dispensary	160	R/S	Babrekar Nagar Municipal Dispensary
74	H/E	Kalina Dispensary*	161	R/S	Charcop Sector- I Muncipal Dispensary
75	H/E	Kherwadi Dispensary	162	R/S	Dahanuwadi Municipal Dispensary
76	H/E	Kolekalyan Dispensary*	163	R/S	Hanuman Nagar Dispensary*
77	H/E	Prabhat Colony Municipal Dispensary	164	R/S	Sambhaji Nagar Dispensary (Purposed)*
78	H/E	S.V. Nagar Dispensary	165	S	Kanjur Village Dispensary
79	H/W	G.N. Station Road Dispensary	166	S	M.V. R Shinde Dispensary
80	H/W	Guru Nanak (Dr. Ambedkar Road) Dispensary	167	S	Shivaji Talav Mumbai Dispensary*
81	H/W	Khar-Danda Dispensary	168	S	Tagor Nagar Dispensary
82	H/W	Old Khar Dispensary*	169	S	Tebhipada Shivaji Nagar Dispensary
	H/W	Shastri Nagar Linking Road Dispensary	170	S	Tirandaz Village Dispensary
83			171	S	Tulshetpada Dispensary
84	K/E	Caves Road Dispensary	172	S	Nahur East Dispensary (Purposed)*
85	K/E	Gundawali Dispensary	173	T	Dindayal Upadhyay (DDU) Dispensary
86	K/E	Hari Nagar Dispensary	174	T	Mulund Colony Dispensary*
87	K/E	Koldongari Dispensary	175	T	P.J.K. Dispensary
88	K/E	Marol Dispensary			

Note: *(*) Upgraded dispensaries with laboratories. The total number of upgraded dispensaries is 33.*

Annexure 2 – Registration of Birth and Death Act 1969

- Provides for registration of births and deaths and for matters connected.

- 'Source of demographic data for socio-economic planning, development of health systems and population control' *(as per 2012 Training Manual for Civil Registration Functionaries in India, Office of Register General of India, Ministry of Home Affairs, Government of India).*

Medical Certification of Causes of Death (MCCD)

In Maharashtra, on every 10th of the month, monthly reports are received at state office of Deputy Chief Registrar of Birth and Death at Pune.

The strategy they follow:

• It is the duty of Registrar (in the case of Mumbai it is Executive Health Officer of MCGM), to ask about form No.4 & 4A according to occurrence of death, while entering the death event.

• Deputy Director is responsible for compilation, coding & analysis of data received through MCCD according to ICD (International Cause of Death) – 10 (http://www.who.int/whosis/icd10/).

Source: http://www.maha-arogya.gov.in/programs/other/sbhivs/strategy.htm

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FORM NO. 4

(See Rule 7)

MEDICAL CERTIFICATE OF CAUSE OF DEATH

(Hospital In-patients. Not to be used for still births)

To be sent to Registrar along with Form No. 2 (Death Report)

Name of the Hospital ....

I hereby certify that the person whose particulars are given below died in the hospital in Ward No...

on .... at ....AM/PM

NAME OF DECEASED					
Sex	Age at Death				For use of Statistical Office
	If 1 year or more, age in years	If less than 1 year, age in month	If less than one month, age in days	If less than one day, age in hours	
1. Male 2. Female					

CAUSE OF DEATH		Interval between onset and death approx.
I Immediate cause State the disease, injury or complication which caused death, not the mode of dying such as heart failure, asthenia, etc.	(a) .... due to (or as a consequences of)	
Antecedent cause Morbid conditions, if any, giving rise to the above cause, stating underlying conditions last	(b) .... due to (or as a consequences of)	
II Other significant conditions contributing to the death but not related to the disease or condition causing it	(c)	

Manner of Death   How did the injury occur?

1. Natural 2. Accident 3. Suicide 4. Homicide
5. Pending investigation

_____

If deceased was a female, was pregnancy the death associated with? 1. Yes 2. No

If yes, was there a delivery?   1. Yes 2. No

_____

Name and signature of the Medical Attendant certifying the cause of death

Date of verification...

_____

SEE REVERSE FOR INSTRUCTIONS

_____

(To be detached and handed over to the relative of the deceased)

Certified that Shri/Smt/Kum.. S/W/D of Shri ....

R/O .... was admitted to this hospital on ....

and expired on ....

Doctor ....
(Medical Supdt.
Name of Hospital)

MEDICAL CERTIFICATE OF CAUSE OF DEATH
Directions for completing the form

Name of deceased: To be given in full. Do not use initials. If deceased is an infant, not yet named at time of death, write 'Son of (S/o)' or 'Daughter of (D/o)', followed by names of mother and father.

Age: If the deceased was over 1 year of age, give age in completed years. If the deceased was below 1 year of age, give age in months and if below 1 month give age in completed number of days, and if below one day, in hours.

Cause of Death: This part of the form should always be completed by the attending physician personally.

The certificate of cause of death is divided into two parts, I and II. Part I is again divided into three parts, lines (a) (b) (c). If a single morbid condition completely explains the deaths, then this will be written on line (a) of Part I, and nothing more need be written in the rest of Part I or in Part II, for example, smallpox, lobar pneumonia, cardiac beriberi, are sufficient cause of death and usually nothing more is needed.

Often, however, a number of morbid conditions will have been present at death, and the doctor must then complete the certificate in the proper manner so that the correct underlying cause will be tabulated. First, enter in Part I(a) the immediate cause of death. This does not mean the mode of dying. e.g., heart failure, respiratory failure, etc. These terms should not be appear on the certificate at all since they are modes of dying and not causes of death. Next consider whether the immediate cause is a complication or delayed result of some other cause. If so, enter the antecedent cause in Part I, line (b). Sometimes there will be three stages in the course of events leading to death. If so, line (c) will be completed. The underlying cause to be tabulated is always written in last in Part I.

Morbid conditions or injuries may be present which were not directly related to the train of events causing death but which contributed in some way to the fatal outcome. Sometimes the doctor finds it difficult to decide, especially for infant deaths, which of several independent conditions was the primary cause of death; but only one cause can be tabulated, so the doctor must decide. If the other diseases are not effects of the underlying cause, they are entered in Part II.

Do not write two or more conditions on a single line. Please write the names of the diseases (in full) in the certificates as legibly as possible to avoid the risk of their being misread.

Onset: Complete the column for interval between onset and death whenever possible, even if very approximately, e.g., "from birth" "several years".

Accidental or violent deaths: Both the external cause and the nature of the injury are needed and should be stated. The doctor or hospital should always be able to describe the injury, stating the part of the body injured, and should give the external cause in full when this is shown. Example : (a) Hypostatic pneumonia; (b) Fracture of neck of femur; (c) Fall from ladder at home.

Maternal deaths: Be sure to answer the question on pregnancy and delivery. This information is needed for all women of child-bearing age, even though the pregnancy may have had nothing to do with the death.

Old age or senility: Old age (or senility) should not be given as a cause of death if a more specific cause is known. If old age was a contributory factor, it should be entered in Part II. Example : (a) Chronic bronchitis, II old age.

Completeness of information: A complete case history is not wanted, but, if the information is available, enough details should be given to enable the underlying cause to be properly classified.

Example: Anaemia – Give type of anaemia, if known. Neoplasm – Indicate whether benign or malignant, and site, with site of primary neoplasm, whenever possible. Heart disease – Describe the condition specifically; if congestive heart failure, chronic on pulmonale, etc., are mentioned, give the antecedent conditions. Tetanus – Describe the antecedent injury, if known. Operation – State the condition for which the operation was performed. Dysentery – Specify whether bacillary, amoebic, etc., if known. Complications of pregnancy or delivery – Describe the complication specifically. Tuberculosis – Give organs affected.

Symptomatic statement: Convulsions, diarrhea, fever, ascites, jaundice, debility, etc., are symptoms which may be due to any one of a number of different conditions. Sometimes nothing more is known, but whenever possible, give the disease which caused the symptom.

Manner of Death: Deaths not due to external cause should be identified as 'Natural'. If the cause of death is known, but it is not known whether it was the result of an accident, suicide or homicide and is subject to further investigation, the cause of death should invariably be filled in and the manner of death should be shown as 'Pending investigation'.

Annexure 3 – Socio Economic Classification (SEC) Note

SEC is used to measure the affluence level of the sample, and to differentiate people on this basis and study their behaviour / attitude on other variables.

While income (either monthly household or personal income) appears to be an obvious choice for such a purpose, it comes with some limitations:

- Respondents are not always comfortable revealing sensitive information such as income.
- The response to the income question can be either over-claimed (when posturing for an interview) or under-claimed (to avoid attention). Since there is no way to know which of these it is and the extent of over-claim or under-claim, income has a poor ability to discriminate people within a sample.
- Moreover, affluence may well be a function of the attitude a person has towards consumption rather than his (or his household's) absolute income level.

Attitude to consumption is empirically proven to be well defined by the education level of the Chief Wage Earner (CWE*) of the household as well as his occupation. The more educated the CWE, the higher is the likely affluence level of the household. Similarly, depending on the occupation that the CWE is engaged in, the affluence level of the household is likely to differ – so a skilled worker will be lower down on the affluence hierarchy as compared to a CWE who is businessman.

Socio Economic Classification or SEC is thus a way of classifying households into groups' basis the education and occupation of the CWE. The classification runs from A1 on the uppermost end thru E2 at the lower most end of the affluence hierarchy. The SEC grid used for classification in market research studies is given below:

EDUCATION / OCCUPATION		Illiterate	literate but no formal schooling / School up to 4th	School 5th – 9th	SSC/ HSC	Some College but not Grad	Grad/ Post-Grad Gen.	Grad/ Post-Grad Prof.
Unskilled Workers		E2	E2	E1	D	D	D	D
Skilled Workers		E2	E1	D	C	C	B2	B2
Petty Traders		E2	D	D	C	C	B2	B2
Shop Owners		D	D	C	B2	B1	A2	A2
Businessmen/ Industrialists with no. of employees	None	D	C	B2	B1	A2	A2	A1
	1 – 9	C	B2	B2	B1	A2	A1	A1
	10 +	B1	B1	A2	A2	A1	A1	A1
Self employed Professional		D	D	D	B2	B1	A2	A1
Clerical / Salesman		D	D	D	C	B2	B1	B1
Supervisory level		D	D	C	C	B2	B1	A2
Officers/ Executives Junior		C	C	C	B2	B1	A2	A2
Officers/Executives Middle/ Senior		B1	B1	B1	B1	A2	A1	A1

CWE is defined as the person who takes the main responsibility of the household expense

Annexure 4 – Guidelines for dispensaries

Table 34: Ward wise dispensary requirements for dispensaries in MCGM

Ward	Ward Name	Population census 2011	Dispensary (1 for 50,000)[39]	Dispensary (1 For 15,000)[40]	Available Municipal Dispensaries
A	Colaba	1,85,014	4	12	6
B	Sandhurst	1,27,290	3	8	5
C	Marine Lines	1,66,161	3	11	5
D	Grant Road	3,46,886	7	23	6
E	Byculla	3,93,286	8	26	12
F/N	Matunga	5,29,034	11	35	6
F/S	Parel	3,60,972	7	24	9
G/N	Dadar	5,99,039	12	40	9
G/S	Elphinstone	3,77,749	8	25	13
H/E	Santa Cruz	5,57,239	11	37	7
H/W	Bandra	3,07,581	6	21	5
K/E	Andheri East	8,23,885	16	55	10
K/W	Andheri West	7,48,688	15	50	7
L	Kurla	9,02,225	18	60	13
M/E	Govandi	8,07,720	16	54	9
M/W	Chembur	4,11,893	8	27	5
N	Ghatkopar	6,22,853	12	42	7
P/N	Malad	9,41,366	19	63	10
P/S	Goregaon	4,63,507	9	31	2
R/C	Borivali	5,62,162	11	37	6
R/N	Dahisar	4,31,368	9	29	4
R/S	Kandivali	6,91,229	14	46	5
S	Bhandup	7,43,783	15	50	7
T	Mulund	3,41,463	7	23	3
Total		**1,24,42,393**	**249**	**830**	**171**

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[39] The Rindani committee report of 1977 suggested that there has to be one dispensary for a population of 50,000 or 1.5 km radius.
[40] The National Urban Health Mission (NUHM) and National Building Code (NBC) suggests that one dispensary is required for a population of 15,000.

To;

M.O.H;

Public health dept;

m/East.

AyD/ME/235/16.8.16.

D: 16/8/16.

संदर्भ : Letter of praja foundation received. on 12.8.16 : (RT for TOP 10 dis.)

Submitting here with report of Top-10 disease report from. April-16 to July -16. of all 9 dispensaries of m/East.

Attached original copy of individual. dispensaries. with this duly signed by m.o.2/c of the dispensaries.

Also. want to make note that. leptospirosis & Dengue are not done confirmed diagnosis at dispensary. level; so the report of lepto & dengue & HiNi (Swan flu) should be considered 0. for all 9 dispensaries.
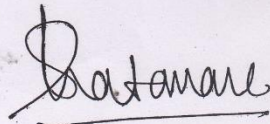
MOH
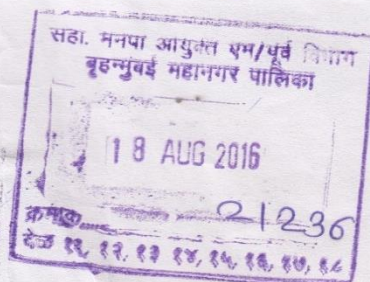
Sr. Medical Officer
Ayodhya Nagar Dispensary
Vashi Naka, M/E, Ward,
Chembur, Mumbai - 400 074

सहा. मनपा आयुक्त एम/पूर्व विभाग
बृहन्मुंबई महानगर पालिका

1 8 AUG 2016

क्रमांक 2/236

मुख्य लिपिक आवक-जावक
एम / पूर्व

प्रति,

वैदयकीय आरोग्य अधिकारी

के / प

_____

डेंग्यू रॅपिड टेस्ट किट
वापरून confirmed
diagnosed cases सापडत नाहीत
हि टेस्ट ~~वर~~ संशयित रूग्णां
मधील शक्यता वारववते .
confirm करण्यासाठी ELISA
व PCR करणे आवश्यक
असते.
सरी डेंग्यू रॅपिड टेस्ट किट
वापरून रॅपिड अँन्टिजेन
पॉझिटिव्ह आलेल्या व वापरलेल्या
किट यांचे व्याख्याना नुसार अहवाल
सोबत जोडल आहे .
आपल्या माहितीसाठी सादर.

(signature)

२०/८/१९ .
Senior Medical Officer
K / W Ward,
N. J. Wadia Mun Dispensary
S. V. Road Opp Rly. Stn
Andheri (W), Mumbai - 58

Annexure 7 – Process flow for Forecasting of Cause of Death data

- **Extracted data for each ward:** Praja had cause of death data age wise, ward wise, gender wise and ICD code wise since 2010 to December 2015 of all 24 wards of MCGM. These were made available by the sub-registrar of each ward. This data was extracted for forecasting values for cause of death for 15 months i.e. from January 2016 to March 2017.

- **Converted data into time series:** Time series is used to extrapolate the information available in past into future. This extracted data was converted into time series.

- **Checked the stationarity of the data:** A stationary time series has properties wherein mean, variance etc. are constant over time for data sets which are being extrapolated. Stationarity of the data was checked and later this was transformed to make it stationary wherever required.

- **Treated data for outliers:** This data was then treated for outliers. Outliers are observations that do not fit into the tendency of time series observed as they differ dramatically from the patterns of the trends of the data.

- **Model tested:** Models tested for forecasting the cause of death data of 15 months (January 2016 to March 2017) include Moving Average, Exponential Smoothing and Autoregressive Integrated Moving Average (ARIMA).

- **ARIMA model was used for forecasting as the error terms were minimum:** ARIMA was used for the forecast as the errors noted were minimum. ARIMA[41] models are, in theory, the most general class of models for forecasting a time series which can be made to be "stationary" by differencing (if necessary), perhaps in conjunction with nonlinear transformations such as logging or deflating (if necessary). A random variable that in a time series is stationary if its statistical properties are all constant over time. An ARIMA model can be viewed as a "filter" that tries to separate the signal from the noise, and the signal is then extrapolated into the future to obtain forecasts.

- **This model considers trends and seasonality in data for forecasting values:** Hence, for the forecast of cause specific death, this model was best suited.

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[41] https://people.duke.edu/~rnau/411arim.htm