HEALTH SERVICE PROVISION IN ANDHRA PRADESH AND TELANGANA

# Assessing Facility Capacity, Costs of Care, and Patient Perspectives

ACCESS, BOTTLENECKS, COSTS, AND QUITY

IHME INSTITUTE FOR HEALTH METRICS AND EVALUATION
UNIVERSITY OF WASHINGTON

PUBLIC HEALTH FOUNDATION OF INDIA

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ABCE | ACCESS, BOTTLENECKS, COSTS, AND QUITY

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# About Public Health Foundation of India

The Public Health Foundation of India (PHFI) is a public-private initiative to build institutional capacity in India for strengthening training, research, and policy development for public health in India. PHFI adopts a broad, integrative approach to public health, tailoring its endeavors to Indian conditions and bearing relevance to countries facing similar challenges and concerns. PHFI engages with various dimensions of public health that encompass promotive, preventive, and therapeutic services, many of which are often lost sight of in policy planning as well as in popular understanding.

# About IHME

The Institute for Health Metrics and Evaluation (IHME) is an independent global health research centre at the University of Washington that provides rigorous and comparable measurement of the world's most important health problems and evaluates the strategies used to address them. IHME makes this information freely available so that policymakers have the evidence they need to make informed decisions about how to allocate resources to best improve population health.



# Collaborations

This project has immensely benefitted from the key inputs and support from Dr. M. Jayaram, Dr. Rajan Shukla, and Dr. G.V.S. Murthy from the Indian Institute of Public Health, Hyderabad. Approvals and valuable support for this project were received from Andhra Pradesh and Telangana state government and district officials, which are gratefully acknowledged.

# About this report

*Assessing Facility Capacity, Costs of Care, and Patient Perspectives: Andhra Pradesh and Telangana* provides a comprehensive assessment of health facility performance in Andhra Pradesh and Telangana, including facility capacity for service delivery, efficiency of service delivery, and patient perspectives on the service they received. Findings presented in this report were produced through the ABCE project in Andhra Pradesh and Telangana, which aims to collate and generate the evidence base for improving the cost-effectiveness and equity of health systems. The ABCE project is funded through the Disease Control Priorities Network (DCPN), which is a multiyear grant from the Bill & Melinda Gates Foundation to comprehensively estimate the costs and cost-effectiveness of a range of health interventions and delivery platforms.

# Acknowledgments

We especially thank all of the health facilities and their staff in Andhra Pradesh and Telangana, who generously gave of their time and facilitated the sharing of facility data that made this study possible. We are also most appreciative of patients of the facilities who participated in this work, as they too were giving of their time and were willing to share their experiences with the field research team.

At PHFI, we wish to thank Rakhi Dandona and Lalit Dandona, who served as the principal investigators for the ABCE project in India. We also wish to thank Anil Kumar for guidance with data collection, management, and analysis. The quantity and quality of the data collected for the ABCE project in India is a direct reflection of the dedication of the field team. We thank the India field coordination team, which included Md. Akbar, G. Mushtaq Ahmed, and S.P. Ramgopal. We also recognize and thank Venkata Srinivas, Amit Kumar, Simi Chacko, Ranjana Kesarwani, Prem Kumar, Sagri Negi, and Sheetal Bishnoi for data management and coordination with field teams.

At IHME, we wish to thank Christopher Murray and Emmanuela Gakidou, who served as the principal investigators. We also recognize and thank staff at IHME: Roy Burstein, Alan Chen, Emily Dansereau, Katya Shackelford, Alexander Woldeab, Alexandra Wollum, and Nick Zyznieuski for managing survey programming, survey updates, data transfer, and ongoing verification at IHME during fieldwork. We are grateful to others who contributed to the project: Michael Hanlon, Santosh Kumar, Herbie Duber, Kelsey Bannon, Aubrey Levine, and Nancy Fullman. Finally, we thank those at IHME who supported publication management, editing, writing, and design.

This report was drafted by Marielle Gagnier, Lauren Hashiguchi, and Nikhila Kalra of IHME and Rakhi Dandona from PHFI.

Funding for this research comes from the Bill & Melinda Gates Foundation under the Disease Control Priorities Network (DCPN).



# Acronyms

| | |
|---|---|
| **ABCE** | Access, Bottlenecks, Costs, and Equity |
| **AH** | Area hospital |
| **ANC** | Antenatal care |
| **ANM** | Auxiliary nurse midwife |
| **APT** | Andhra Pradesh and Telangana |
| **CHC** | Community health centre |
| **CI** | Confidence interval |
| **DCPN** | Disease Control Priorities Network |
| **DEA** | Data envelopment analysis |
| **DOTS** | Directly observed therapy, short-course |
| **DH** | District hospital |
| **IHME** | Institute for Health Metrics and Evaluation |
| **IPHS** | Indian Public Health Standards |
| **NCD** | Non-communicable disease |
| **OR** | Odds ratio |
| **PHC** | Primary health centre |
| **PHFI** | Public Health Foundation of India |
| **SFA** | Stochastic frontier analysis |
| **SHC** | Sub health centre |
| **STI** | Sexually transmitted infection |
| **WHO** | World Health Organization |

# Terms and definitions

Definitions presented for key technical terms used in the report.

**Constraint**
a factor that facilitates or hinders the provision of or access to health services. Constraints exist as both "supply-side," or the capacity of a health facility to provide services, and "demand-side," or patient-based factors that affect health-seeking behaviors (e.g., distance to the nearest health facility, perceived quality of care received by providers).

**Data Envelopment Analysis (DEA)**
an econometric analytic approach used to estimate the efficiency levels of health facilities.

**Efficiency**
a measure that reflects the degree to which health facilities are maximizing the use of the resources available in producing services.

**Facility sampling frame**
the list of health facilities from which the ABCE sample was drawn. This list was based on a 2011–2013 facility inventory published by the Andhra Pradesh and Telangana state government.

**Inpatient visit**
a visit in which a patient has been admitted to a facility. An inpatient visit generally involves at least one night spent at the facility, but the metric of a visit does not reflect the duration of stay.

**Inputs**
tangible items that are needed to provide health services, including facility infrastructure and utilities, medical supplies and equipment, and personnel.

**Outpatient visit**
a visit at which a patient receives care at a facility without being admitted.

**Outputs**
volumes of services provided, patients seen, and procedures conducted, including outpatient and inpatient care, laboratory and diagnostic tests, and medications.

**Platform**
a channel or mechanism by which health services are delivered.

**Stochastic Frontier Analysis (SFA)**
an econometric analytic approach used to estimate the efficiency levels of health facilities.



Table 1 defines the types of health facilities in Andhra Pradesh and Telangana; this report will refer to facilities according to these definitions.

**TABLE 1** Health facility types in Andhra Pradesh and Telangana[1]

| Health facility types in Andhra Pradesh and Telangana |
|---|
| **District Hospital (DH)**<br>These facilities are the secondary referral level for a given district. Their objective is to provide comprehensive secondary health care services to the district's population. DHs are sized according to the size of the district population, so the number of beds varies from 75 to 500. |
| **Area Hospital (AH)**<br>These facilities are sub-district/sub-divisional hospitals below the district and above the block-level hospitals (CHC). As First Referral Units, they provide emergency obstetrics care and neonatal care. These facilities serve populations of 500,000 to 600,000 people and have a bed count varying between 31 and 100 beds. |
| **Community Health Centre (CHC)**<br>These facilities constitute the secondary level of health care and were designed to provide referral as well as specialist health care to the rural population. They act as the block-level health administrative unit and as the gatekeeper for referrals to higher level facilities. Bed strength ranges up to 30 beds. |
| **Primary Health Centre (PHC)**<br>These facilities provide rural health services. PHCs serve as referral units for primary health care from Sub-Centres and refer cases to CHC and higher-order public hospitals. Depending on the needs of the region, PHCs may be upgraded to provide 24-hour emergency hospital care for a number of conditions. A typical PHC covers a population of 20,000 to 30,000 people and hosts about six beds. |
| **Sub Health Centre (SHC)**<br>Along with PHCs, these facilities provide rural health care. SHCs typically provide outpatient care, which includes immunizations, and refer inpatient and deliveries to higher-level facilities. |

1 Directorate General of Health Services, Ministry of Health & Family Welfare, and Government of India. *Indian Public Health Standards (IPHS) Guidelines*. New Delhi, India: Government of India, 2012.

# Executive summary

With the aim of establishing universal health coverage, India's national and state governments have invested significantly in expanding and strengthening the public health care sector. This has included a particular commitment to extending its reach to rural populations and reducing disparities in access to care for marginalized groups. However, in order to realize this goal it is necessary for the country to critically consider the full range of factors that contribute to or hinder progress toward it.

Since its inception in 2011, the Access, Bottlenecks, Costs, and Equity (ABCE) project has sought to comprehensively identify what and how components of health service provision – access to services, bottlenecks in delivery, costs of care, and equity in care received – affect health system performance in several countries. Through the ABCE project, multiple sources of data, including facility surveys and patient exit interviews, are linked together to provide a nuanced picture of how facility-based factors (supply-side) and patient perspectives (demand-side) influence optimal service delivery.

Led by the Public Health Foundation of India (PHFI) and the Institute for Health Metrics and Evaluation (IHME), the ABCE project in Andhra Pradesh and Telangana is uniquely positioned to inform the evidence base for understanding the country's drivers of health care access and costs of care. Derived from a state-representative sample of 98 facilities, the findings presented in this report provide governments, international agencies, and development partners alike with actionable information that can help identify areas of success and targets for improving health service provision.

The main topical areas covered in this report move from an assessment of facility-reported capacity for care, to quantifying the services actually provided by facilities and the efficiency with which they operate; tracking facility expenditures and the costs associated with different types of service provision; and comparing patient perspectives of the care they received across different types of facility. Further, we provide an in-depth examination and comparison of facility-level outputs, efficiency, capacity, and patient experiences. It is with this information that we strive to provide the most relevant and actionable information for health system programming and resource allocation in Andhra Pradesh and Telangana.

## Facility capacity for service provision

### While most facilities report providing key health services, significant gaps in capacity were identified between reported and functional capacity for care.

- Health facilities generally reported a high availability of a subset of key services. Services such as antenatal care, routine deliveries, pediatrics, general medicine, and emergency care were nearly universally available across facilities.
- Few facilities reported available services for non-communicable diseases (NCDs). Low numbers of district hospitals reported providing psychiatry (50%), cardiology (25%), or chemotherapy (13%.)
- Basic medical equipment such as scales, stethoscopes, and blood pressure apparatus were widely available at all health facility levels, but laboratory equipment such as glucometers, blood chemistry analyzers, and incubators were less readily available. For example, only 67% of district hospitals had test strips for glucometers, dropping to 31% at the community health centre level. This shows limited capacity for testing throughout the health system, with particular implications for diagnosing and treating NCDs.
- Gaps also emerged with regard to imaging equipment. CT scans were available in 78% of district hospitals but in no area hospital.
- A service capacity gap emerged for the majority of health facilities across several types of services. Many facilities reported providing a given service but lacked full capacity to properly deliver it, for instance lacking functional equipment or medications. For example, while almost all primary and community health centres reported providing routine delivery care, none were fully equipped to do so. This discordance has substantial programmatic and policy implications for the health system in Andhra Pradesh and Telangana, highlighting continued challenges in ensuring facilities have all the supplies they need to provide a full range of services.





### Physical infrastructure of health facilities has improved, but gaps in transport and communication remain.

- Functional electricity was available at all hospitals, community health centres, and primary health centres. Eighty-one percent of sub health centres had electricity, showing substantial improvement over figures from past studies.
- Access to piped water was generally high at district hospitals (100%), area hospitals (90%), community health centres (88%), and primary health centres (78%), but was limited at sub health centres (38%). Similarly, there was nearly universal availability (97%–100%) of flush toilets at all health facility types except sub health centres (56%). These figures reflects investments into improving physical infrastructure at health facilities, though discrepancies remain between high- and low-level facilities.
- There was relatively high access to some form of communication at community health centres (75% had access to phones and 75% to computers) and primary health centres (50% to phone and 81% to computers). Just 31% of community health centres had access to an emergency vehicle and primary health centres did not have emergency transportation. Given that these types of facilities often play key referral functions, these findings have serious implications for coordinating the care and transportation of patients.

### Nurses composed the majority of staff at hospitals, while at health centres para-medical staff outnumbered both doctors and nurses.

- In general, hospitals reported that they staff more nurses than doctors, and tend to employ slightly more doctors and nurses than para- or non-medical personnel. On the other hand, most primary health centres reported fewer or the same number of nurses as doctors, and overwhelmingly employ more para- and non-medical staff than nurses or doctors.
- As expected, the staff numbers were concentrated at district hospitals with an average of nearly 150 personnel. Area hospitals had the second-highest number of personnel, but this was less than half of that at district hospitals, while health centres averaged between two and 30 staff. While some of this variation is a result of service provision and population size, this also demonstrates relative shortages in human resources for health.

## Facility production of health services

### While outpatient visits remained steady over time, there were increases in inpatient visits.

- Between 2007 and 2011, most facility types experienced relatively unchanged levels of outpatient visits, with a slight increase in visits observed for district hospitals. Outpatient visits accounted for the large majority of patients seen per staff member per day across all facility types. Inpatient visits increased for all facility types between 2007 and 2011.

### Facilities showed capacity for larger patient volumes given observed resources.

- In generating estimates of facility-based efficiency, or the alignment of facility resources with the number of patients seen or services produced, we found a wide range of efficiency levels within and across facility types. The average efficiency score of district hospitals ranged from 28% to 71%, with a platform average of 61%. Area hospitals were between 37% and 87% efficient. Community health centres were between 24% and 79% efficient; four facilities were less than 50% efficient and three facilities were 75% or more efficient. The range of efficiency scores was widest for primary health centres, from 23% to 82%, with 11 facilities at less than 50% efficient.

- If they operated at optimal efficiency, district hospitals could provide 116,316 additional outpatient visits with the same inputs (including physical capital and personnel), while primary health centres could produce 27,144 additional outpatient visits.
- These efficiency scores indicate that there is considerable room for health facilities to expand service production given their existing resources. Future work on pinpointing specific factors that heighten or hinder facility efficiency, and how efficiency is related to the quality of service provision, should be considered.

## Costs of care

### Trends in average facility spending between 2007 and 2011 varied between facility types, though all platforms recorded higher spending in 2011 than 2007.

- Spending on personnel accounted for the vast majority of annual spending across facility types. Compared to other facility types, area hospitals and primary health centres put a slightly greater proportion of their total expenditure toward personnel, while community health centres put the greatest proportion toward medical supplies.

## Patient perspectives

### Travel and wait times were shorter for patients visiting lower-level facilities than higher-level ones.

- Nearly all patients receiving care at sub health centres, and over 80% of patients at primary health centres, reported traveling less than 30 minutes to receive care. In contrast, more than half of patients at district hospitals had travel times of over 30 minutes, reflecting the greater distances people travel to receive specialist treatment from facilities of this type.
- More than two-thirds of patients waited less than 30 minutes to receive care across all facilities. Nearly all patients seeking care at sub health centres received care in less than 30 minutes.

### Patients gave higher ratings of health care providers than facility characteristics.

- In general, patients receiving care from doctors reported relatively higher levels of satisfaction than those treated by nurses. Satisfaction with staff interactions, both for doctors and nurses, were lowest at community health centres and highest at primary and sub health centres.
- Facility characteristics, such as cleanliness and privacy, received generally low ratings from patients. Cleanliness at hospitals received particularly low marks. As with staff interactions, patient satisfaction with facility characteristics was higher at primary and sub health centres.
- Most patients received all drugs that they were prescribed during their visits. Proportions of patients receiving all prescribed drugs ranged from 81% of patients at district hospitals to 95% at sub health centres.
- Longer wait times were associated with lower satisfaction ratings from patients, while receiving all prescribed drugs was associated with higher levels of patient satisfaction.

With its multidimensional assessment of health service provision, findings from the ABCE project in Andhra Pradesh and Telangana provide an in-depth examination of health facility capacity, costs of care, and how patients view their interactions with the health system. Andhra Pradesh and Telangana's health provision landscape was markedly heterogeneous, and will likely continue to evolve over time. This highlights the need for continuous and timely assessment of health service delivery, which is critical for identifying areas of successful implementation and quickly responding to service disparities or faltering performance. Expanded analyses would also allow for an even clearer picture of the trends and drivers of facility capacity, efficiencies, and costs of care. With regularly collected and analyzed data, capturing information from health facilities, recipients of care, policymakers, and program managers can yield the evidence base to make informed decisions for achieving optimal health system performance and the equitable provision of cost-effective interventions throughout Andhra Pradesh and Telangana.





# Introduction

The performance of a country's health system ultimately shapes the health outcomes experienced by its population, influencing the ease or difficulty with which individuals can seek care and facilities can address their needs. At a time when international aid is plateauing[1] and the government of India has prioritized expanding many health programs,[2,3] identifying health system efficiencies and promoting the delivery of cost-effective interventions has become increasingly important.

Assessing health system performance is crucial to optimal policymaking and resource allocation; however, due to the multidimensionality of health system functions,[4] comprehensive and detailed assessment seldom occurs. Rigorously measuring what factors are contributing to or hindering health system performance – access to services, bottlenecks in service delivery, costs of care, and equity in service provision throughout a country – provides crucial information for improving service delivery and population health outcomes.

The Access, Bottlenecks, Costs, and Equity (ABCE) project was launched globally in 2011 to address these gaps in information. In addition to India, the multi-pronged, multi-partner ABCE project has taken place in seven other countries (Bangladesh, Colombia, Ghana, Kenya, Lebanon, Uganda, and Zambia). In India, the ABCE project was undertaken in six states – Andhra Pradesh and Telangana, Gujarat, Madhya Pradesh, Odisha, and Tamil Nadu.

The ABCE project, with the goal of rigorously assessing the drivers of health service delivery across a range of settings and health systems, strives to answer these critical questions facing policymakers and health stakeholders in each country or state for public-sector health care service delivery:

- What health services are provided, and where are they available?
- What are the bottlenecks in provision of these services?
- How much does it cost to produce health services?
- How efficient is provision of these health services?

Findings from each country's ABCE work will provide actionable data to inform their own policymaking processes and needs. Further, ongoing cross-country analyses will likely yield more global insights into health service delivery and costs of health care. These eight countries have been purposively selected for the overarching ABCE project as they capture the diversity of health system structures, composition of providers (public and private), and disease burden profiles. The ABCE project contributes to the global evidence base on the costs of and capacity for health service provision, aiming to develop data-driven and flexible policy tools that can be adapted to the particular demands of governments, development partners, and international agencies.

The Public Health Foundation of India (PHFI) and the Institute for Health Metrics and Evaluation (IHME) compose the core team for the ABCE project in India, and they received vital support and inputs from the state Ministry of Health and Family Welfare for data collection, analysis, and interpretation. The core team harnessed information from distinct but linkable sources of data, drawing from a state-representative sample of health facilities to create a large and fine-grained database of facility attributes, expenditure, and capacity, patient characteristics, and outcomes. By capturing the interactions between facility characteristics and patient perceptions of care, we have been able to piece together what factors drive or hinder optimal and equitable service provision in rigorous, data-driven ways.

1 Institute for Health Metrics and Evaluation (IHME). *Financing Global Health 2015: Development assistance steady on the path to new Global Goals*. Seattle, WA: IHME, 2016.
2 Planning Commission Government of India. *Eleventh Five Year Plan (2007-12)*. New Delhi, India: Government of India, 2007.
3 Planning Commission Government of India. *Twelfth Five Year Plan (2012-17)*. New Delhi, India: Government of India, 2012.
4 *Murray CJL, Frenk J. A Framework for Assessing the Performance of Health Systems. Bulletin of the World Health Organization. 2000; 78 (6): 717-731.*

We focus on the facility because health facilities are the main points through which most individuals interact with the health system or receive care. Understanding the capacities and efficiencies within and across different types of public-sector health facilities unveils the differences in health system performance at the level most critical to patients – the facility level. We believe this information is immensely valuable to governments and development partners, particularly for decisions on budget allocations. By having data on what factors are related to high facility performance and improved health outcomes, policymakers and development partners can then support evidence-driven proposals and fund the replication of these strategies at facilities throughout India.

The ABCE project in India has sought to generate the evidence base for improving the cost-effectiveness and equity of health service provision. In this report, we examine facility capacity across platforms, as well as the efficiencies and costs associated with service provision for each type of facility. Based on patient exit interviews, we consider the factors that affect patient perceptions of and experiences with the state's health system. By considering a range of factors that influence health service delivery, we have constructed a nuanced understanding of what helps and hinders the receipt of health services through facilities in the states of Andhra Pradesh and Telangana.

The results discussed in this report are far from exhaustive; rather, they align with identified priorities for health service provision and aim to answer questions about the costs of health care delivery in the respective state in India. This report provides an in-depth examination of health facility capacity across different platforms, specifically covering topics on human resource capacity, facility-based infrastructure and equipment, health service availability, patient volume, facility-based efficiencies, costs associated with service provision, and demand-side factors of health service delivery as captured by patient exit interviews.

Table 2 defines the cornerstone concepts of the ABCE project: Access, Bottlenecks, Costs, and Equity.

**TABLE 2** Access, Bottlenecks, Costs, and Equity

| Access, Bottlenecks, Costs, and Equity |
|---|
| **Access**<br>Health services cannot benefit populations if they cannot be accessed; thus, measuring which elements are driving improved access to – or hindering contact with – health facilities is critical. Travel time to facilities, user fees, and cultural preferences are examples of factors that can affect access to health systems. |
| **Bottlenecks**<br>Mere access to health facilities and the services they provide is not sufficient for the delivery of care to populations. People who seek health services may experience supply-side limitations, such as medicine stockouts, that prevent the receipt of proper care upon arriving at a facility. |
| **Costs**<br>Health service costs can translate into very different financial burdens for consumers and providers of such care. Thus, the ABCE project measures these costs at several levels, quantifying what facilities spend to provide services. |
| **Equity**<br>Various factors influence how populations interact with a health system. The nature of these interactions either facilitate or obstruct access to health services. In addition to knowing the cost of scaling up a given set of services, it is necessary to understand costs of scale-up for specific populations and across population-related factors (e.g., distance to health facilities). The ABCE project aims to pinpoint which factors affect the access to and use of health services and to quantify how these factors manifest. |





# ABCE project design

For the ABCE project in India, we conducted primary data collection through a two-pronged approach:

1. A comprehensive facility survey administered to a representative sample of health facilities in select states in India (the ABCE Facility Survey)
2. Interviews with patients as they exited the sampled facilities

Here, we provide an overview of the ABCE survey design and primary data collection mechanisms. All ABCE survey instruments are available online at http://www.healthdata.org/dcpn/india.

## ABCE Facility Survey

Through the ABCE Facility Survey, direct data collection was conducted from a state-representative sample of health service platforms and captured information on the following indicators for the five fiscal years (running from April to March of the following year) prior to the survey:

- **Inputs:** the availability of tangible items that are needed to provide health services, including infrastructure and utilities, medical supplies and equipment, pharmaceuticals, personnel, and non-medical services.
- **Finances:** expenses incurred, including spending on infrastructure and administration, medical supplies and equipment, pharmaceuticals including vaccines, and personnel. Facility funding from different sources (e.g., central and state governments) and revenue from service provision were also captured.
- **Outputs:** volume of services and procedures produced, including outpatient and inpatient care, emergency care, and laboratory and diagnostic tests.
- **Supply-side constraints and bottlenecks:** factors that affected the ease or difficulty with which patients received services they sought, including bed availability, pharmaceutical availability and stockouts, cold-chain capacity, personnel availability, and service availability.

Table 3 provides more information on the specific indicators included in the ABCE Facility Survey.

**TABLE 3** Modules included in the ABCE Facility Survey in India

| SURVEY MODULE | SURVEY CATEGORY | KEY INDICATORS AND VARIABLES |
|---|---|---|
| **Module 1: Facility finances and inputs** | Inputs | Input funding sources, managing authority, and maintenance information<br>Availability and functionality of medical and non-medical equipment |
| | Finances | Salary/wages, benefits, and allowances<br>Total expenses for infrastructure and utilities; medical supplies and equipment; pharmaceuticals; administration and training; non-medical services, personnel (salaries and wages, benefits, allowances)<br>Performance and performance-based financing questions |
| | Revenue | User fees; total revenue and source |
| | Personnel characteristics | Total personnel by cadre<br>Funding sources of personnel<br>Health services provided and their staffing; administrative and support services and their staffing |
| **Module 2: Facility management and direct observation** | Facility management and infrastructure characteristics | Characteristics of patient rooms; electricity, water, and sanitation<br>Facility meeting characteristics<br>Guideline observation |
| | Direct observation | Latitude, longitude, and elevation of facility. Facility hours, characteristics, and location; waiting and examination room characteristics |
| **Module 3: Lab-based consumables, equipment, and capacity** | Facility capacity | Lab-based tests available |
| | Medical consumables and equipment | Lab-based medical consumables and supplies available |
| **Module 4: Pharmaceuticals** | Facility capacity | Drug availability and stockout information |
| **Module 5: General medical consumables, equipment, and capacity** | Medical consumables and equipment | Availability and functionality of medical furniture, equipment, and supplies<br>Inventory of procedures for sterilization, sharp items, and infectious waste<br>Inventory of personnel |
| **Module 6: Facility outputs** | Facility capacity | Fund and vehicle availability for referral and emergency referral |
| | General service provision | Inpatient care and visits; outpatient care and visits; emergency visits; home or outreach visits<br>Laboratory and diagnostic tests |
| **Module 7: Vaccines** | Facility procedures for vaccine supply, delivery, and disposal | Source from vaccine obtained<br>Personnel administering vaccine<br>Procedures to review adverse events<br>Disposal of vaccines |
| | Vaccine availability, storage, and output | Stock availability and stockouts of vaccines and syringes<br>Types and functionality of storage equipment for vaccines<br>Temperature chart history; vaccine inventory and vaccine outputs; vaccine outreach and home visits<br>Vaccine sessions planned and held |



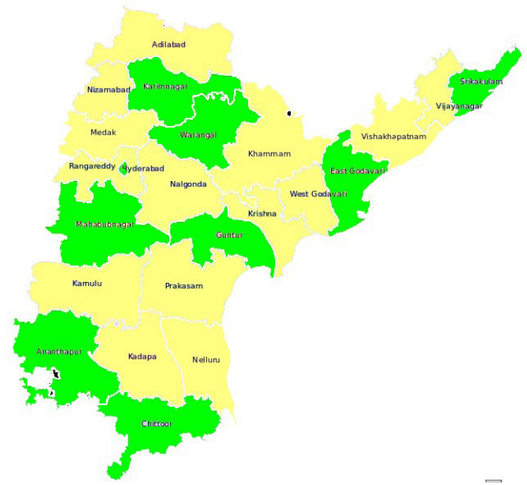


## Sample design

A total of nine districts in Andhra Pradesh and Telangana were selected for the ABCE survey (Figure 1). The districts were selected using three strata to maximize heterogeneity: proportion of full immunization in children aged 12–23 months as an indicator of preventive health services; proportion of safe delivery (institutional delivery or home delivery assisted by skilled person) as an indicator of acute health services; and proportion of urban population as an indicator of overall development. The districts were grouped as *high* and *low* for urbanization based on median value, and into three equal groups as *high*, *medium,* and *low* for the safe delivery and full immunization indicators. Eight districts were selected randomly from each of the various combinations of indicators, and in addition the capital district was selected purposively.

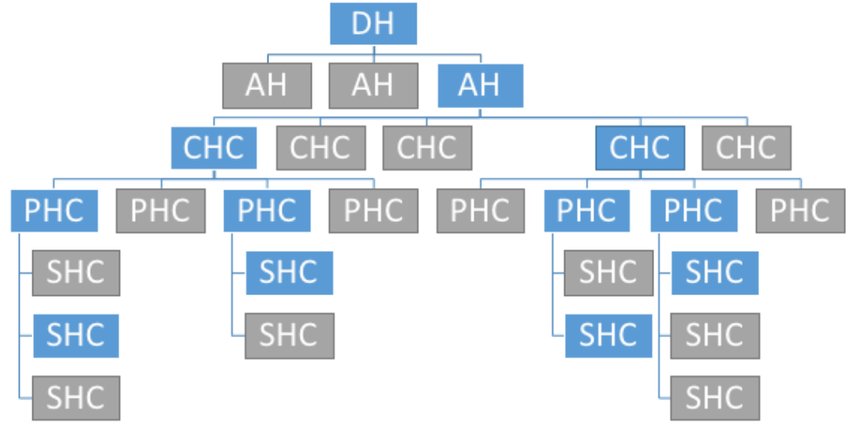
Within each sampled district, we then sampled public sector health facilities at all levels of service based on the structure of the state health system (Figure 2). In each sampled district, one district hospital (DH); one area hospital (AH, from a total of two or three) for each sampled DH; two community health centres (CHC, from a total of two to five) for each sampled AH; two primary health centres (PHC, from a total of two to four) for each sampled CHC; and one sub centre (SHC, from a total or one to four) for each sampled PHC were randomly selected for the study.

**FIGURE 1** Sampled districts in Andhra Pradesh and Telangana




Sampled districts are highlighted in green.

**FIGURE 2** Sampling strategy for health facilities in a district in the ABCE survey in India




Selected facilities are in blue; unselected facilities from the sampling frame are in grey.
**DH:** District hospital; **AH:** Area hospital; **CHC:** Community health centre; **PHC:** Primary health centre; **SHC:** Sub health centre

**TABLE 4** Types of questions included in the Patient Exit Interview Survey in India

| SURVEY CATEGORY | TYPES OF KEY QUESTIONS AND RESPONSE OPTIONS |
|---|---|
| **Direct observation of patient** | Sex of patient (and of patient's attendant if surveyed) |
| **Direct interview with patient** | Demographic questions (e.g., age, level of education attained, caste)<br><br>Scaled-response satisfaction scores (e.g., satisfaction with medical doctor)<br><br>Open-ended questions for circumstances and reasons for facility visit, as well as visit characteristics (e.g., travel time to facility)<br><br>Reporting costs associated with facility visit (user fees, medications, transportation, tests, other), with an answer of "yes" prompting follow-up questions pertaining to amount |

**TABLE 5** Facility sample, by platform, for the ABCE project in APT

| FACILITY TYPE | FINAL SAMPLE |
|---|---|
| **District hospital** | 8 |
| **Area hospital** | 10 |
| **Community health centre** | 16 |
| **Primary health centre** | 32 |
| **Sub health centre** | 32 |
| **Total health facilities** | 98 |

## Patient exit interview survey

A fixed number patients or attendants of patients were interviewed at each facility, based on the expected outpatient density for the platform. A target of 24 patients were interviewed at district hospitals, 16 at AH, 12 at CHC, 10 at PHC and five at SHC. Patient selection was based on a convenience sample. The main purpose of the Patient Exit Interview Survey was to collect information on patient perceptions of the health services they received and other aspects of their facility visit (e.g., travel time to facility, costs incurred during the facility visit, and satisfaction with the health care provider). Table 4 provides more information on the specific indicators included in the exit survey. This information fed into quantifying the "demand-side" constraints to receiving care (as opposed to the facility-based, "supply-side" constraints and bottlenecks measured by the ABCE Facility Survey).

## Data collection for the ABCE survey in APT

Data collection took place from January to July 2013. Prior to survey implementation, PHFI and the data collection agency hosted a two-week training workshop for 40 interviewers, who received extensive training on the electronic data collection software (DatStat), the survey instruments, the APT health system's organization, and interviewing techniques. Following this workshop, a one-week pilot of all survey instruments took place at health facilities. Ongoing training occurred on an as-needed basis throughout the course of data collection.





All collected data went through a thorough verification process between PHFI and IHME and the ABCE field team. Following data collection, the data were methodically cleaned and re-verified, and securely stored in databases hosted at PHFI and IHME.

A total of 98 health facilities participated in the ABCE project in APT. Seven facilities were replaced (one DH, one AH, one CHC, and four PHC) because data were unavailable for the years considered; the reporting chain of the sampled facility was not correct; or the facility was functional for a shorter duration.

# Main findings
## Health facility profiles

The delivery of facility-based health services requires a complex combination of resources, ranging from personnel to physical infrastructure, that vary in their relative importance and cost to facilities. Determining what factors support the provision of services at lower costs and higher levels of efficiency at health facilities is critical information for policymakers to expand health system coverage and functions within constrained budgets.

Using the ABCE APT facility sample (Table 5), we analyzed five key drivers of health service provision at facilities:

- Facility-based resources (e.g., human resources, infrastructure and equipment, and pharmaceuticals), which are often referred to as facility inputs.
- Patient volumes and services provided at facilities (e.g., outpatient visits, inpatient bed-days), which are also known as facility outputs.
- Patient-reported experiences, capturing "demand-side" factors of health service delivery.
- Facility alignment of resources and service production, which reflects efficiency.
- Facility expenditures and production costs for service delivery.

These components build upon each other to create a comprehensive understanding of health facilities in Andhra Pradesh and Telangana, highlighting areas of high performance and areas for improvement.

## Facility capacity and characteristics

### Service availability

Across and within district hospitals, area hospitals, and community health centres in APT (Table 6), several notable findings emerged for facility-based health service provision. While fundamental services such as routine deliveries, general medicine, pediatric care, and pharmacy were nearly universally available, few facilities reported available services for non-communicable disease such as cardiology, psychiatry, and chemotherapy. District hospitals reported a wide range of services such as blood banks, surgical services, and emergency obstetrics. Area hospitals generally offered fewer services than district hospitals but reported high coverages of services like obstetrics services, antenatal care, and STI/HIV services.

### Human resources for health

A facility's staff size and composition directly affect the types of services it provides. In general, a greater availability of health workers is related to higher service utilization and better health outcomes.[1] India has a severe shortage of qualified health workers, and the workforce is concentrated in urban areas.[2] The public health system has a shortage of both medical and paramedical personnel. The number of primary and community health centres without adequate staff is substantially higher if high health-worker absenteeism is taken into consideration.[3] The Indian Government is aware of the additional requirements and shortages in the availability of health workers for the future. The National Rural Health Mission, for instance, recommends a vastly strengthened infrastructure, with substantial increases in personnel at every tier of the public health system.[4]

Based on the ABCE sample, we found substantial heterogeneity across facility types in APT by considering the total number of staff in the context of bed strength (i.e., number of beds in the facility) and patient load (Figure 3). Overall, the most common staff at district and area hospitals were nurses, while at lower levels, paramedical staff

1 Rao KD, Bhatnagar A, Berman P. So many, yet few: Human resources for health in India. Human Resources for Health. 2012; 10(19).
2 Rao M, Rao KD, Kumar AK, Chatterjee M, Sundararaman T. Human resources for health in India. The Lancet. 2011; 377(9765): 587-98.
3 Hammer J, Aiyar Y, Samji S. Understanding government failure in public health services. *Economic and Political Weekly*. 2007; 42: 4049–58.
4 National Rural Health Mission. Ministry of Health and Family Welfare, Government of India. Mission Document (2005-2012). New Delhi, India: Government of India, 2005.





**TABLE 6** Availability of services in health facilities, by platform

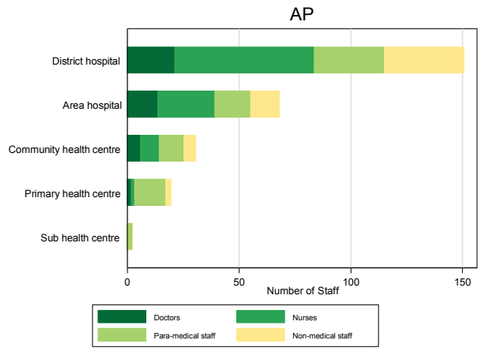
| | DISTRICT HOSPITAL | AREA HOSPITAL | COMMUNITY HEALTH CENTRE |
|---|---|---|---|
| Surgical services | 100% | 100% | 81% |
| Accident, trauma, and emergency | 100% | 100% | 100% |
| Pediatric | 100% | 100% | 100% |
| General anesthesiology | 100% | 100% | 81% |
| Routine birth services | 100% | 100% | 94% |
| Emergency obstetric services | 100% | 100% | 88% |
| Antenatal care | 100% | 100% | 100% |
| Immunization | 100% | 80% | 50% |
| Internal/general medicine | 100% | 100% | 100% |
| Cardiology | 25% | 50% | 56% |
| Psychiatric | 50% | 40% | 6% |
| Ophthalmology | 100% | 70% | 50% |
| Dermatology | 88% | 40% | 25% |
| Orthopedics | 88% | 70% | 44% |
| Dentistry | 100% | 100% | 75% |
| DOTS treatment | 88% | 90% | 75% |
| STI/HIV | 88% | 90% | 69% |
| Burns | 75% | 80% | 69% |
| Chemotherapy | 13% | 20% | NA |
| Alternative medicine | 75% | 40% | 56% |
| Pharmacy | 100% | 100% | 100% |
| Diagnostic medical | 100% | 100% | 69% |
| Laboratory services | 100% | 100% | 100% |
| Blood bank | 88% | 70% | 6% |
| Mortuary | 88% | 70% | 63% |
| Outreach services | 25% | 0% | 0% |

**NA:** Not applicable to this platform according to standards.

LOWEST AVAILABILITY — HIGHEST AVAILABILITY

**Note:** All values represent the percentage of facilities, by platform, that reported offering a given service at least one day during a typical week.

**FIGURE 3** Composition of facility personnel, by platform




outnumbered doctors and nurses. This is a reflection of the differential service offerings between higher- and lower-level facilities. Additionally, higher-level facilities tended to have a greater number of health personnel overall; while a degree of this variation is due to differences in service provision and population size, some of this indicates relative shortages in human resources for health.

The volume of human resources across the platforms was on the expected lines with the greatest number of doctors, nurses, para-medical staff, and non-medical staff concentrated at the district hospitals, and the least at the sub-health centres. Area hospitals reported the second highest number of personnel; however, the total personnel at these facilities was less than half of that reported by district hospitals. Community health centres maintained a smaller body of health workers, an average total of 30, with most workers reported to be nurses and paramedical staff. Primary health centres reported, on average, 20 health workers in total, most of which were paramedical staff. Finally, sub-health centres reported two paramedical and non-medical personnel who perform immunizations, simple outpatient care, and community outreach.

### Nurses to doctors ratio

The ratio of number of nurses to number of doctors is presented in Figure 4. A ratio greater than 1 indicates that nurses outnumber doctors; for instance, a ratio of 2 indicates that there are two nurses staffed for every one doctor. Alternatively, a ratio lower than 1 indicates that

**FIGURE 4** Ratio of nurses to doctors by platform

Vertical bars represent the platform average ratio.

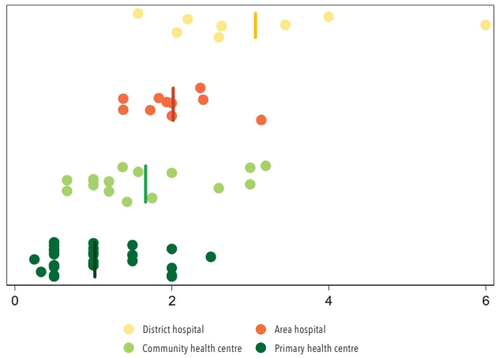
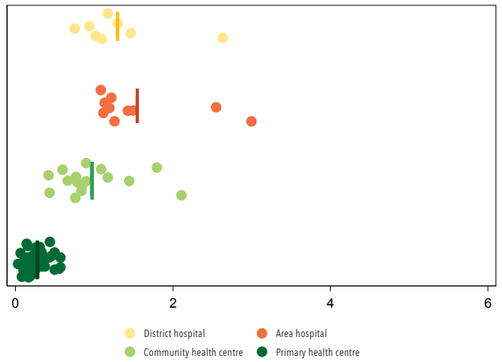



**FIGURE 5** Ratio of nurses and doctors to para-medical and non-medical staff by platform

Vertical bars represent the platform average ratio.




doctors outnumber nurses; for instance, a ratio of 0.5 indicates there is one nurse staffed for every two doctors.

In general, district hospitals reported a high ratio, indicating that they staff more nurses than doctors. However, the ratio reported by various district hospitals ranged from 1.6 to 6. All area hospitals reported more nurses than doctors. There was heterogeneity among community health centres, with ratios ranging from 0.7 to 3.2. Finally, most primary health centres reported fewer or the same number of nurses staffed as doctors, though five facilities report ratios equal to or greater than 2.

### Nurses and doctors to paramedical and non-medical staff

The ratio of number of nurses and/or doctors to number of paramedical and/or non-medical staff in 2011 is presented in Figure 5. A ratio greater than 1 indicates that nurses and doctors outnumber paramedical and non-medical personnel; for instance, a ratio of 2 indicates that there are two nurses and/or doctors staffed for every one paramedical/non-medical staff. Alternatively, a ratio lower than 1 indicates that paramedical and/or non-medical personnel outnumber nurses and/or doctors.

Most district and all area hospitals reported ratios greater than 1, with average ratios reported as 1.3 and 1.5, respectively. Community health centres reported an average ratio of 1.0, with facilities reporting ratios that ranged from 0.4 to 2.1. Notably, primary health centres overwhelmingly employ more paramedical and non-medical staff than doctors and nurses, with all facilities reporting a ratio less than 0.6.

### Beds to doctors ratio

The ratio of number of beds to number of doctors in 2011 is presented in Figure 6. A ratio greater than 1 indicates that beds outnumber doctors; for instance, a ratio of 2 indicates that there are two beds for every one doctor staffed. Alternatively, a ratio lower than 1 indicates that doctors outnumber beds.

The average ratio of beds to doctors is highest in district hospitals (18.4), largely driven by one facility with few doctors staffed (ratio of 83.3). Area hospitals have an average of 9.7 doctors per bed with a range from 4.8 to 23.3, while community health centres have an average of 7.1 with a range from 1.6 to 16.7. Primary health centres have an average ratio of beds to doctors of 3.2.

### Beds to nurses ratio

The ratio of number of beds to number of nurses in 2011 is presented in Figure 7. A ratio greater than 1 indicates that beds outnumber nurses; for instance, a ratio of 2 indicates that there are two beds for every one nurse staffed. Alternatively, a ratio lower than 1 indicates that nurses outnumber beds.





**FIGURE 6** Ratio of beds to doctors by platform

Vertical bars represent the platform average ratio.

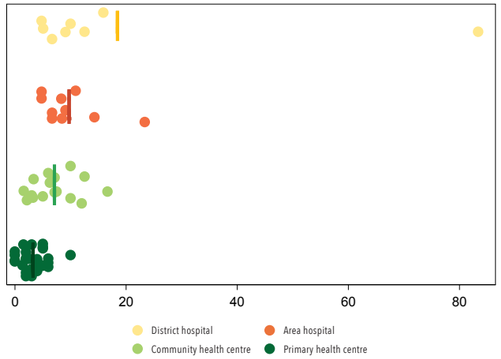
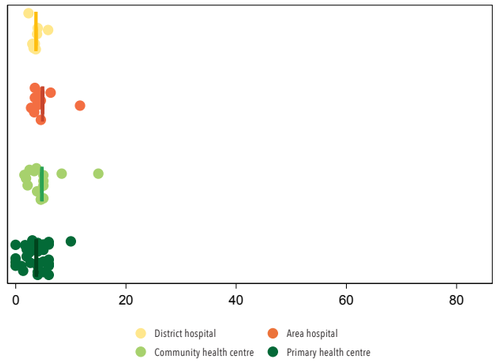



**FIGURE 7** Ratio of beds to nurses by platform

Vertical bars represent the platform average ratio.




The average ratio of beds to nurses was similar for area hospitals (4.8) and community health centres (4.7), and only slightly higher than primary health centres (3.7) and distrcit hospitals (3.7). The ratio of beds to nurses was most heterogenous among community health centres, ranging from 1.6 to 15.0. Conversely, the range of ratios for district hosptials was narrow (2.3 to 5.9).

In isolation, facility staffing numbers are less meaningful without considering a facility's overall patient volume and production of specific services. For instance, if a facility mostly offers services that do not require a doctor's administration, failing to achieve the doctor staffing target may be less important than having too few nurses. Further, some facilities may have much smaller patient volumes than others, and thus "achieving" staffing targets could leave them with an excess of personnel given patient loads. While an overstaffed facility has a different set of challenges than an understaffed one, each reflects a poor alignment of facility resources and patient needs. To better understand bottlenecks in service delivery and areas to improve costs, it is important to assess a facility's capacity (inputs) in the context of its patient volume and services (outputs). We further explore these findings in the "Efficiency and costs" section. As part of the ABCE project in India, we compare levels of facility-based staffing with the production of different types of health services. In this report, we primarily focus on the delivery of health services by skilled medical personnel, which include doctors, nurses, and other paramedical staff. It is possible that non-medical staff also contribute to service provision, especially at lower levels of care, but the ABCE project in India is not currently positioned to analyze these scenarios.

### Infrastructure and equipment

Health service provision depends on the availability of adequate facility infrastructure, equipment, and supplies (physical capital). In this report, we focus on four essential components of physical capital: power supply, water and sanitation, transportation, and medical equipment, with the latter composed of laboratory, imaging, and other medical equipment. Table 7 illustrates the range of physical capital, excluding medical equipment, available across platforms.

### Power supply

All hospitals, community health centres, and primary health centres reported access to a functional electrical supply (Table 7). Among smaller facilities, 19% of sub-health centres lacked functional electricity. Across platforms, 57% of facilities with functional electricity also had a generator. No facilities reported solely relying on a generator for power.

Inadequate access to consistent electric power has

**TABLE 7** Availability of physical capital, by platform

| | DISTRICT HOSPITAL | AREA HOSPITAL | COMMUNITY HEALTH CENTRE | PRIMARY HEALTH CENTRE | SUB HEALTH CENTRE |
|---|---|---|---|---|---|
| **Functional electricity** | 100% | 100% | 100% | 100% | 81% |
| **Piped water** | 100% | 90% | 88% | 78% | 38% |
| **Flush toilet** | 100% | 100% | 100% | 97% | 56% |
| **Hand disinfectant** | 78% | 100% | 94% | 84% | 75% |
| **Any four-wheel vehicle** | 89% | 90% | 38% | NA | NA |
| **Emergency four-wheel vehicle** | 78% | 80% | 31% | NA | NA |
| **Landline phone** | 13% | 20% | 75% | 50% | NA |
| **Computer** | 89% | 100% | 75% | 81% | NA |

LOWEST AVAILABILITY — HIGHEST AVAILABILITY

**NA:** Not applicable to this platform according to standards.

**Note:** Values represent the percentage of facilities, by platform, that had a given type of physical capital

substantial implications for health service provision, particularly for the effective storage of medications, vaccines, and blood samples. These results demonstrate an improvement in the availability of electricity at the lowest platform level compared to 2005, when only 52.2% of sub-health centres had electric supply.[5]

### Water and sanitation

District hospitals had the highest availability of improved water and sanitation sources, with 100% of these hospitals having functional piped water and sewer infrastructure with flush toilets (Table 7). Generally, more facilities had sewer infrastructure than functional piped water. All area hospitals and community health centres along with 97% of primary health centres had sewer infrastructure, while only 56% of sub-health centres had sewer infrastructure. Hand disinfectant was broadly available across platforms as a supplementary sanitation method. Access to piped water declined further down the health system, with most area hospitals (90%), community health centres (88%), and primary health centres (78%) having piped water. The source of water for sub-health centres was mostly piped water (38%) and boreholes (32%). Among all facilities, 45% reported a severe shortage of water at some point during the year. These findings show a mixture of notable gains and ongoing needs for facility-based water sources and sanitation practices among primary care facilities.

### Transportation and computers

Facility-based transportation and modes of communication varied across platforms (Table 7). In general, the availability of a vehicle, irrespective of its emergency capabilities, substantially decreased down the levels of health platforms. The primary health centres did not have emergency transportation, which means transferring patients under emergency circumstances from these facilities could be fraught with delays and possible complications. The availability of a functional computer was seen in 89% of the district hospitals and 100% of the area hospitals.

### Equipment

For three main types of facility equipment – medical, lab, and imaging – clear differences emerge across levels of health service provision, with Table 8 summarizing the availability of functional equipment by platform.

We used WHO's Service Availability and Readiness Assessment (SARA) survey as our guideline for what types of

5 Bajpai N, Dholakia RH, and Sachs JD. Scaling up Primary Health Services in Rural India: Public Investment Requirements and Health Sector Reform, Case Studies of Andhra Pradesh and Karnataka. New York: Centre on Globalization and Sustainable Development; 2008. Centre on Globalization and Sustainable Development Working Paper Series, No. 33.





**TABLE 8** Availability of functional equipment, by platform

| | DISTRICT HOSPITAL | AREA HOSPITAL | COMMUNITY HEALTH CENTRE | PRIMARY HEALTH CENTRE | SUB-HEALTH CENTRE |
|---|---|---|---|---|---|
| **Medical equipment** | | | | | |
| Wheelchair | 100% | 100% | 100% | 91% | NA |
| Adult scale | 100% | 90% | 100% | 97% | 100% |
| Child scale | 100% | 100% | 94% | 78% | 56% |
| Blood pressure apparatus | 100% | 90% | 100% | 100% | 97% |
| Stethoscope | 100% | 100% | 100% | 100% | 100% |
| Light source | 100% | 100% | 100% | 91% | 63% |
| **Lab equipment** | | | | | |
| Glucometer | 89% | 60% | 56% | 47% | NA |
| Test strips for glucometer | 67% | 30% | 31% | 38% | NA |
| Hematologic counter | 44% | 50% | 50% | 34% | NA |
| Blood chemistry analyzer | 44% | 10% | 0% | 3% | NA |
| Incubator | 78% | 30% | 13% | 3% | NA |
| Centrifuge | 100% | 100% | 75% | 53% | NA |
| Microscope | 100% | 100% | 94% | 78% | NA |
| Slides | 100% | 100% | 100% | 97% | 75% |
| Slide covers | 89% | 90% | 94% | 81% | 34% |
| **Imaging equipment** | | | | | |
| X-ray | 100% | 100% | 69% | NA | NA |
| ECG | 89% | 100% | 25% | NA | NA |
| Ultrasound | 100% | 90% | 21% | NA | NA |
| CT scan | 78% | 0% | NA | NA | NA |

**NA:** Not applicable to this platform according to standards.

LOWEST AVAILABILITY — HIGHEST AVAILABILITY

**Note:** Availability of a particular piece of equipment was determined based on facility ownership on the day of visit. Data on the number of items present in a facility were not collected. All values represent the percentage of facilities, by platform, that had a given piece of equipment.

equipment should be available in hospitals and primary care facilities.[6] Table 8 illustrates the distribution of SARA scores across platforms. In general, hospitals had greater availability of medical equipment, and notable deficits in essential equipment availability were found in the lower levels of care. Lacking scales and blood pressure cuffs can severely limit the collection of important patient clinical data. Microscopes and corresponding components were most prevalent among all facilities, including primary health centres, but additional testing capacity was generally limited, even among district hospitals. For instance, 44% of district hospitals and 10% of area hospitals had a blood chemistry analyzer. While 60% of area hospitals had a functional glucometer, only 30% had test strips for the glucometer; this trend was evident across all platforms, indicating limited capacity for addressing non-communicable diseases (NCDs). District and area hospitals had good availability of imaging equipment, with the notable exception of CT scans, which were available in 78% of district hospitals and no area hospitals. Community health centres had poor availability of essential imaging equipment.

Overall, these findings demonstrate gradual improvements in equipping health facilities with basic medical equipment in APT, as well as the continued challenge of ensuring that these facilities carry the supplies they need to provide a full range of services. Measuring the availability of individual pieces of equipment sheds light on specific deficits, but assessing a health facility's full stock of necessary or recommended equipment provides a

6 World Health Organization (WHO). *Service Availability and Readiness Assessment (SARA) Survey: Core Questionnaire*. Geneva, Switzerland: WHO, 2013.

**TABLE 9** Availability of tests and functional equipment to perform routine antenatal care, by platform

| | DISTRICT HOSPITAL (DH) | AREA HOSPITAL (AH) | COMMUNITY HEALTH CENTRE (CHC) | PRIMARY HEALTH CENTRE (PHC) | SUB HEALTH CENTRE (SHC) |
|---|---|---|---|---|---|
| **Testing availability** | | | | | |
| Urinalysis | 100% | 90% | 94% | 78% | 73% |
| Hemoglobin | 100% | 100% | 100% | 78% | 90% |
| Glucometer and test strips | 67% | 30% | 31% | 39% | 40% |
| Blood typing | 100% | 100% | 63% | 41% | NA |
| **Functional equipment** | | | | | |
| Blood pressure apparatus | 100% | 90% | 100% | 100% | 97% |
| Adult scale | 100% | 90% | 100% | 97% | 100% |
| Ultrasound | 100% | 90% | NA | NA | NA |
| **Service summary** | | | | | |
| Facilities reporting ANC services | 100% | 100% | 100% | 100% | 100% |
| Facilities fully equipped for ANC provision based on above tests and equipment availability | 67% | 30% | 0% | 28% | 19% |

**NA:** Not applicable to this platform according to standards.

LOWEST AVAILABILITY — HIGHEST AVAILABILITY

**Note:** Availability of a given ANC item was determined by its availability at a facility on the day of visit. All values represent the percentage of facilities, by platform, that had the given ANC item. The service summary section compares the total percentage of facilities reporting that they provided ANC services with the total percentage of facilities that carried all of the functional equipment to provide ANC services.





**TABLE 10** Availability of blood tests and functional equipment to perform routine delivery care, by platform

| | DISTRICT HOSPITAL (DH) | AREA HOSPITAL (AH) | COMMUNITY HEALTH CENTRE (CHC) | PRIMARY HEALTH CENTRE (PHC) |
|---|---|---|---|---|
| **Testing availability** | | | | |
| Hemoglobin | 100% | 100% | 100% | 78% |
| Glucometer and test strips | 67% | 30% | 31% | 39% |
| Cross-match blood | 89% | 80% | NA | NA |
| **Medical equipment** | | | | |
| Blood pressure apparatus | 100% | 90% | 100% | 100% |
| IV catheters | 100% | 100% | 100% | 88% |
| Gowns | 100% | 100% | 100% | 81% |
| Measuring tape | 78% | 100% | 69% | 78% |
| Masks | 100% | 100% | 100% | 94% |
| Sterilization equipment | 100% | 90% | 100% | 92% |
| Adult bag valve mask | 100% | 90% | 86% | 92% |
| Ultrasound | 100% | 90% | NA | NA |
| **Delivery equipment** | | | | |
| Infant scale | 100% | 100% | 93% | 86% |
| Scissors or blade to cut umbilical cord | 100% | 100% | 100% | 100% |
| Needle holder | 100% | 100% | 94% | 94% |
| Speculum | 100% | 100% | 100% | 93% |
| Delivery forceps | 100% | 90% | 93% | 83% |
| Dilation and curettage kit | 89% | 100% | 87% | 66% |
| Neonatal bag valve mask | 100% | 100% | 80% | 86% |
| Vacuum extractor | 56% | 80% | 33% | 31% |
| Incubator | 78% | 80% | 60% | 28% |
| **Service summary** | | | | |
| Facilities reporting delivery services | 100% | 100% | 94% | 97% |
| Facilities fully equipped for delivery services based on the above tests and equipment availability | 38% | 30% | 0% | 0% |

**NA:** Not applicable to this platform according to standards.

LOWEST AVAILABILITY — HIGHEST AVAILABILITY

**Note:** Availability of a given delivery item was determined by its availability at a facility on the day of visit. All values represent the percentage of facilities, by platform, that had the given delivery item. The service summary section compares the total percentage of facilities reporting that they provided routine delivery services with the total percentage of facilities that carried all of the recommended pharmaceuticals and functional equipment to provide routine delivery services.

**TABLE 11** Availability of blood tests and functional equipment to perform general surgery, by platform

| | DISTRICT HOSPITAL (DH) | AREA HOSPITAL (AH) | COMMUNITY HEALTH CENTRE (CHC) | PRIMARY HEALTH CENTRE (PHC) |
|---|---|---|---|---|
| **Testing availability** | | | | |
| Hemoglobin | 100% | 100% | 100% | 78% |
| Cross-match blood | 89% | 80% | NA | NA |
| **Medical equipment** | | | | |
| Blood pressure apparatus | 100% | 90% | 100% | 100% |
| IV catheters | 100% | 100% | 100% | 88% |
| Sterilization equipment | 100% | 90% | 88% | 72% |
| Gowns | 100% | 100% | 100% | 81% |
| Masks | 100% | 100% | 100% | 94% |
| Adult bag valve mask | 100% | 90% | 75% | 72% |
| **Surgical equipment** | | | | |
| Surgical scissors/blade | 100% | 100% | 94% | 91% |
| Thermometer | 100% | 90% | 88% | 78% |
| General anesthesia equipment | 100% | 100% | 56% | 19% |
| Scalpel | 89% | 100% | 69% | 56% |
| Suction apparatus | 100% | 100% | 81% | 28% |
| Retractor | 100% | 100% | 81% | 69% |
| Nasogastric tube | 89% | 90% | 69% | 47% |
| Blood storage unit/refrigerator | 89% | 100% | 50% | NA |
| Intubation equipment | 100% | 80% | 50% | 28% |
| **Service summary** | | | | |
| Facilities reporting general surgery services | 89% | 100% | 81% | 50% |
| Facilities fully equipped for general surgery services based on the above tests and equipment availability | 88% | 60% | 13% | 6% |

**NA:** Not applicable to this platform according to standards.

LOWEST AVAILABILITY — HIGHEST AVAILABILITY

**Note:** Availability of a given surgery item was determined by its availability at a facility on the day of visit. All values represent the percentage of facilities, by platform, that had the given surgery item. The service summary section compares the total percentage of facilities reporting that they provided general surgery services with the total percentage of facilities that carried all of the recommended functional equipment to provide general surgery services.





more precise understanding of a facility's service capacity.

## Focus on service provision

For the production of any given health service, a health facility requires a complex combination of the basic infrastructure, equipment, and pharmaceuticals, with personnel who are adequately trained to administer necessary clinical assessments, tests, and medications. Thus, it is important to consider this intersection of facility resources to best understand facility capacity for care. In this report, we further examined facility capacity for a subset of specific services – antenatal care, delivery, general surgery, and laboratory testing. For these analyses of service provision, we only included facilities that reported providing the specific service, excluding facilities that were potentially supposed to provide a given service but did not report providing it in the ABCE Facility Survey. Thus, our findings reflect more of a service capacity "ceiling" across platforms, as we are not reporting on the facilities that likely should provide a given service but have indicated otherwise on the ABCE Facility Survey.

## Antenatal care services

In APT, according to the National Family Health Survey-4, 76% of women had at least four antenatal care (ANC) visits during their last pregnancy.[7] While this level of coverage is noteworthy, it neither reflects what services were actually provided nor the quality of care received. Through the ABCE Facility Survey, we estimated what proportion of facilities stocked the range of tests and medical equipment to conduct a routine ANC visit. It is important to note that this list was not exhaustive but represented a number of relevant supplies necessary for the provision of ANC.

The availability of tests and functional equipment for

7 International Institute for Population Sciences (IIPS). *National Family Health Survey (NFHS-4), 2015-2016: Andhra Pradesh Factsheet*. Mumbai, India: IIPS, 2016.

**TABLE 12** Availability of laboratory tests, by platform

| | DISTRICT HOSPITAL (DH) | AREA HOSPITAL (AH) | COMMUNITY HEALTH CENTRE (CHC) | PRIMARY HEALTH CENTRE (PHC) |
|---|---|---|---|---|
| Blood typing | 100% | 100% | 63% | 41% |
| Cross-match blood | 89% | 80% | NA | NA |
| Complete blood count | 89% | 80% | 50% | 16% |
| Hemoglobin | 100% | 100% | 100% | 78% |
| HIV | 100% | 100% | 94% | 66% |
| Liver function | 67% | 30% | 13% | NA |
| Malaria | 100% | 90% | 94% | 84% |
| Renal function | 56% | 20% | 13% | 3% |
| Serum electrolytes | 22% | 0% | 0% | NA |
| Spinal fluid test | 33% | 0% | 6% | NA |
| Syphilis | 100% | 90% | 50% | NA |
| Tuberculosis skin | 100% | 100% | 94% | 44% |
| Urinalysis | 100% | 90% | 94% | 78% |

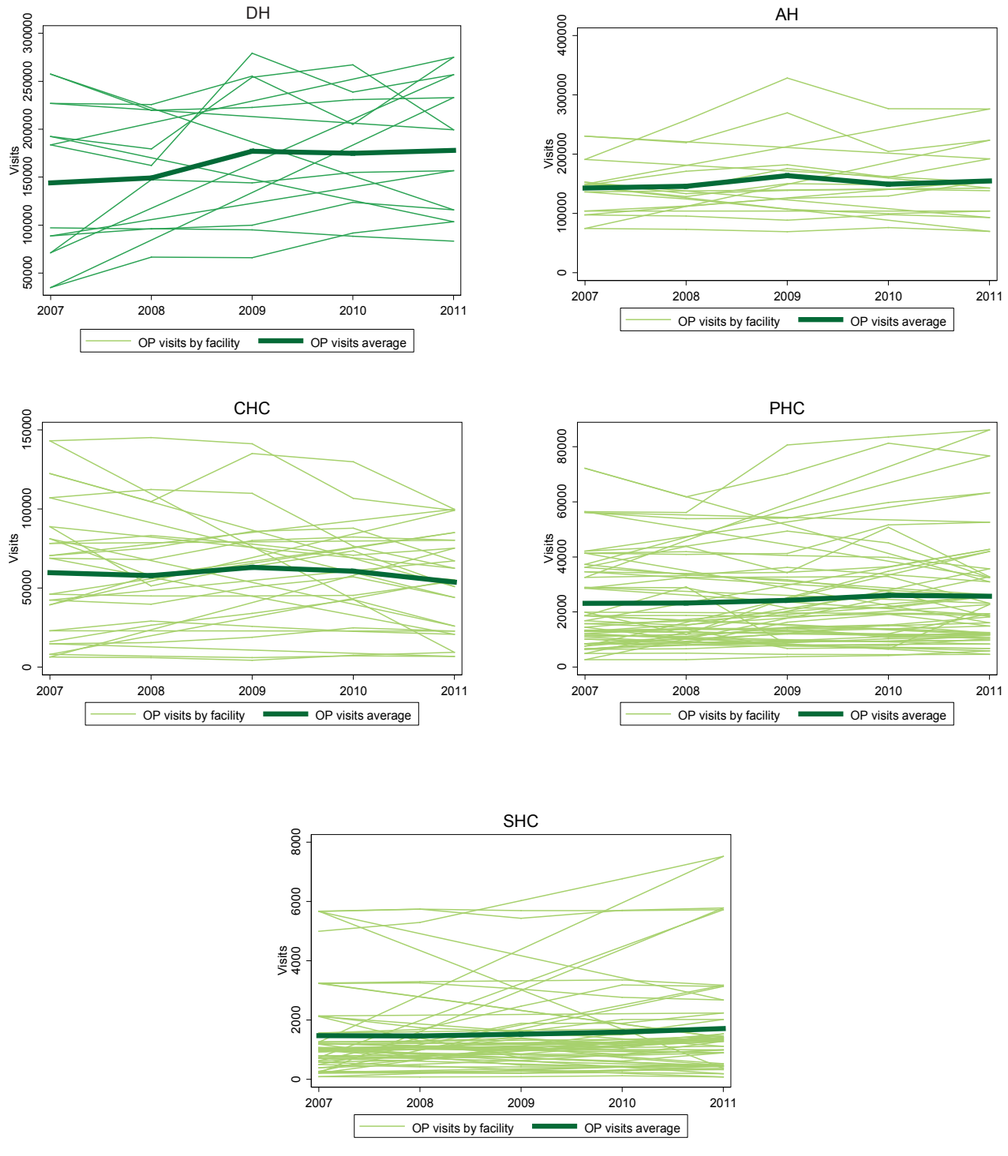
**NA:** Not applicable to this platform according to standards.

LOWEST AVAILABILITY — HIGHEST AVAILABILITY

**Note:** Availability of a given test was determined by its availability at a facility on the day of visit. All values represent the percentage of facilities, by platform, that had the given test.

**FIGURE 8** Number of outpatient visits, by platform

**Note:** Each line represents outpatient visits for an individual facility, with the bold line depicting the average for the platform. Scales are different for each platform.








ANC is presented in Table 9. While all facilities in this survey reported providing ANC services, many were not adequately supplied for care. There was a lack of glucometer and test strips across all platforms. Primary health centres and sub-centres lacked many essential tests.

Across the levels of care, we found a widening gap between facility-reported capacity for ANC provision and the fraction of the facilities fully equipped to deliver ANC care. This service-capacity gap meant that many facilities, from district hospitals to the lower levels of care, reported providing ANC but then lacked at least one piece of functional equipment needed to optimally address the range of patient needs during an ANC visit. Lack of simple tests or material for tests (such as glucometer and test strips or blood pressure apparatus) prevented most facilities from being listed as fully equipped to provide ANC services. These findings do not suggest that these platforms are entirely unable to provide adequate ANC services; it simply means that the vast majority of facilities did not have the recommended diagnostics and medical equipment for ANC.

## Delivery care services

While 92% of deliveries in APT are in a health facility, only 38% of deliveries are in public facilities.[8] Availability of essential equipment is necessary for providing high-quality delivery care; these results are presented in Table 10. Availability was generally highest in district hospitals, declining at lower levels. While most commu-

8 International Institute for Population Sciences (IIPS). *National Family Health Survey (NFHS-4), 2015-2016: Andhra Pradesh Factsheet.* Mumbai, India: IIPS, 2016.

**FIGURE 9** Number of inpatient visits (excluding deliveries), by platform

**Note:** Each line represents inpatient visits for an individual facility, with the bold line depicting the average for the platform. Scales are different for each platform.

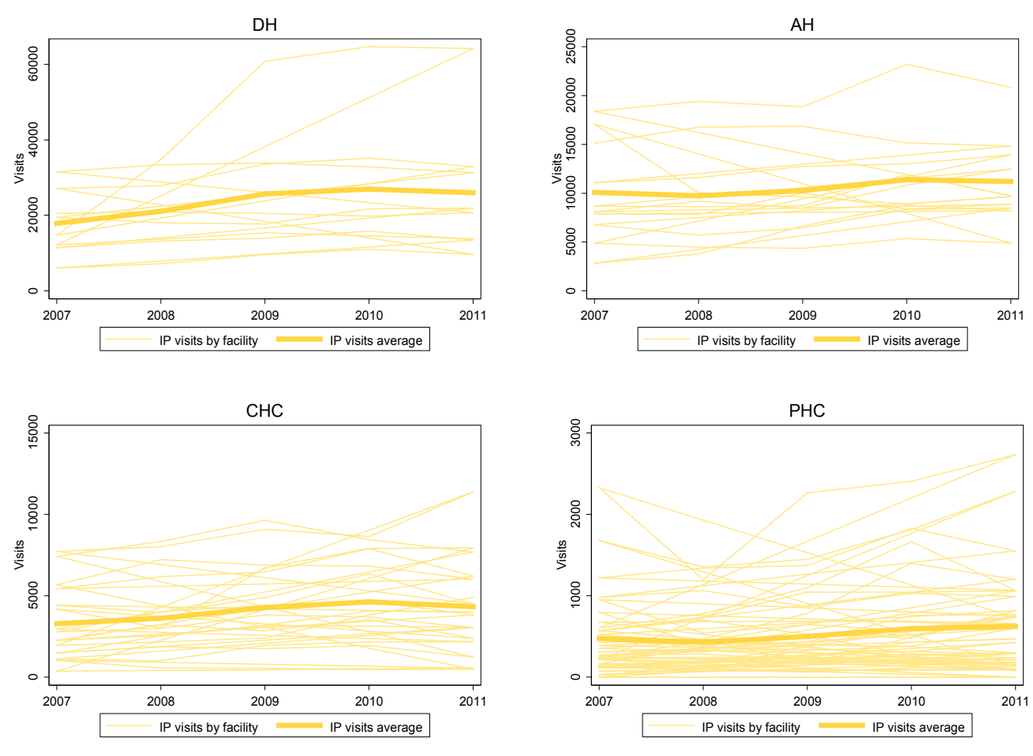
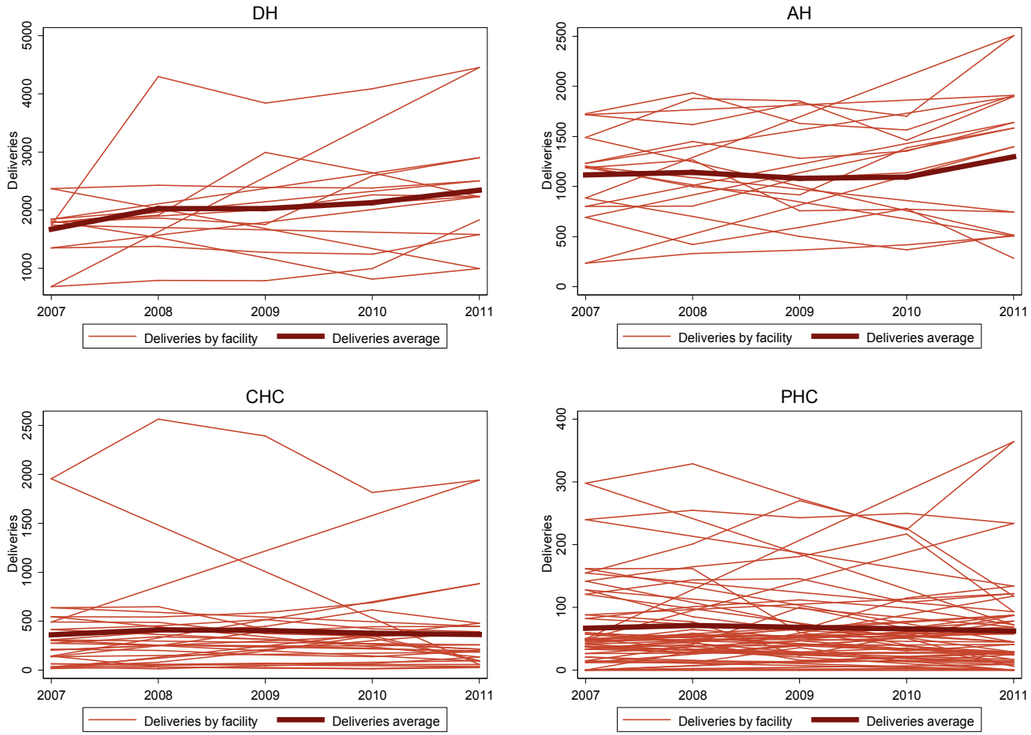


**FIGURE 10** Number of deliveries, by platform

**Note:** Each line represents deliveries visits for an individual facility, with the bold line depicting the average for the platform. Scales are different for each platform.




nity health centres and primary health centres offered routine delivery services, none had all essential tests and equipment available. Only one-third of district and area hospitals were fully equipped. Notably, nearly half of district hospitals lacked vacuum extractors.

This finding is cause for concern, as not having access to adequate delivery equipment can affect both maternal and neonatal outcomes at all levels of care.[9,10] Again, we found a substantial gap between the proportion of facilities, across platforms, that reported providing routine delivery services and those that were fully equipped for their provision.

### General surgery services

Availability of essential tests and equipment for general surgery services is presented in Table 11. At least 80% of area and district hospitals had each of the essential items; availability was substantially lower in community health centres and primary health centres. Generally, medical equipment was mostly available across all platforms (at least 72%), while there are large gaps in availability for testing and surgical equipment. Few primary health centres reported equipment for gen-

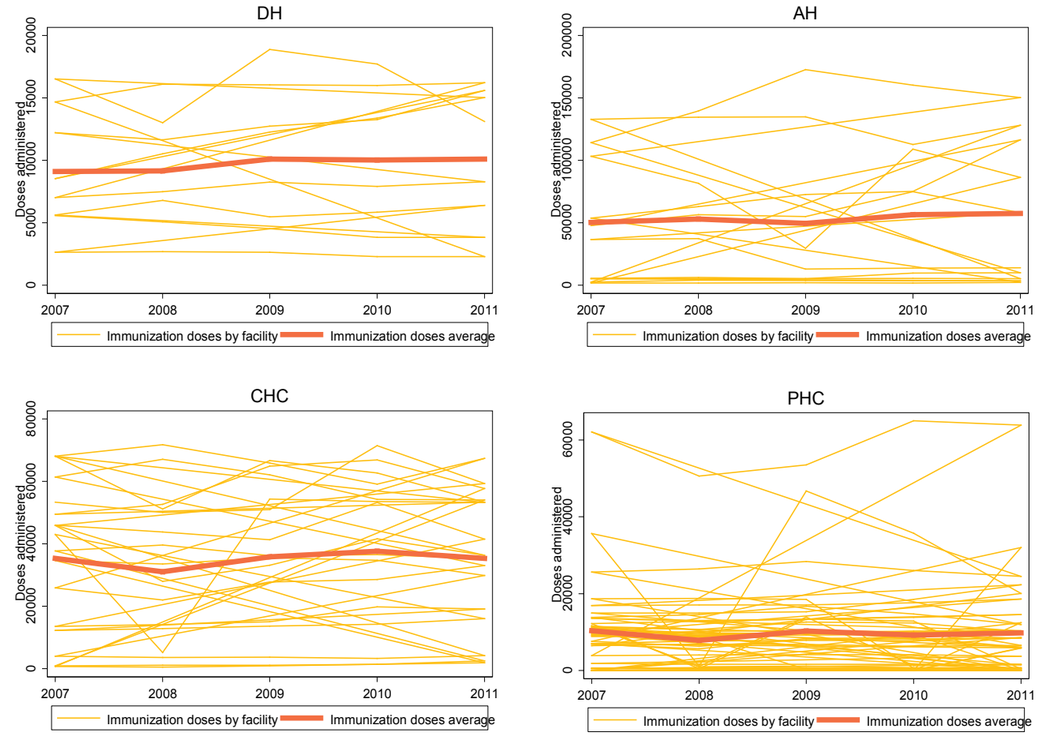
9 Nyamtema AS, Urassa DP, van Roosmalen J. Maternal health interventions in resource limited countries: a systematic review of packages, impacts and factors for change. *BMC Pregnancy and Childbirth*. 2011; 11(30).
10 Wall SN, Lee ACC, Carlo W, Goldenberg R, Niermeyer S, Darmstadt GL, et al. Reducing intrapartum-related neonatal deaths in low- and middle-income countries – what works? *Seminars in Perinatology*. 2010; 34: 395–407.





**FIGURE 11** Number of immunization doses administered, by platform

**Note:** Each line represents immunization doses for an individual facility, with the bold line depicting the average for the platform. Scales are different for each platform.



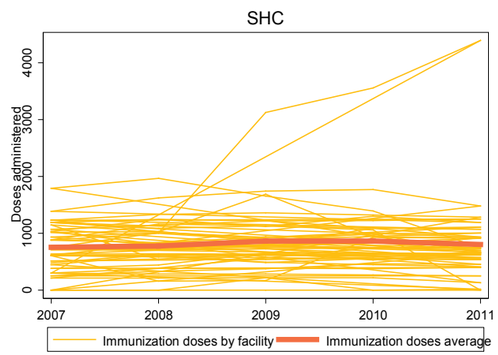



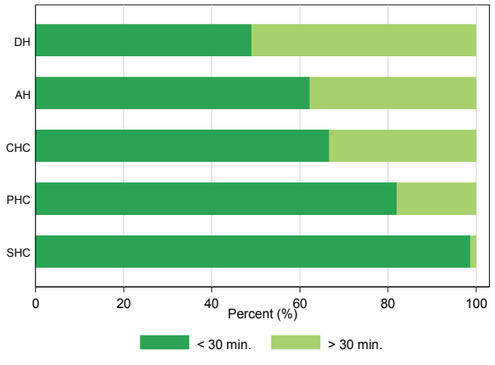
**TABLE 13** Characteristics of patients interviewed after receiving care at facilities

| | DH | AH | CHC | PHC | SHC | TOTAL |
|---|---|---|---|---|---|---|
| **Total patient sample** | 278 | 199 | 250 | 318 | 153 | 1198 |
| **Women** | 41% | 49% | 46% | 48% | 69% | 49% |
| **Patient's age group (years)** | | | | | | |
| <16 | 11% | 15% | 10% | 10% | 5% | 10% |
| 16-29 | 25% | 22% | 16% | 15% | 31% | 21% |
| 30-39 | 17% | 15% | 16% | 14% | 19% | 16% |
| 40-49 | 17% | 15% | 19% | 16% | 12% | 16% |
| >50 | 30% | 33% | 38% | 44% | 32% | 36% |
| **Scheduled caste/Scheduled tribe** | 21% | 18% | 23% | 20% | 20% | 20% |
| **Other backward caste** | 60% | 66% | 62% | 63% | 58% | 62% |
| **Education attainment** | | | | | | |
| None | 37% | 44% | 54% | 60% | 50% | 49% |
| Classes 1 to 5 | 20% | 17% | 17% | 17% | 12% | 17% |
| Classes 6 to 9 | 14% | 14% | 12% | 10% | 16% | 13% |
| Class 10 or higher | 30% | 26% | 18% | 13% | 22% | 21% |

**DH:** District hospital; **AH:** Area hospital; **CHC:** Community health centre; **PHC:** Primary health centre; **SHC:** Sub health centre

**Note:** Educational attainment refers to the patient's level of education or the attendant's educational attainment if the interviewed patient was younger than 18 years old.

**FIGURE 12** Patient travel times to facilities, by platform




**DH:** District hospital; **AH:** Area hospital; **CHC:** Community health centre; **PHC:** Primary health centre; **SHC:** Sub health centre

eral anesthesia. It is also crucial to consider the human resources available to perform surgical procedures, as assembling an adequate surgical team is likely to affect patient outcomes. Given the nature of documentation of human resources in the records, such data could not be captured, but future work on assessing surgical capacity at health facilities should collect this information.

### Laboratory testing

The availability of laboratory tests is presented in Table 12. While all district hospitals, area hospitals, and community health centres offer laboratory services, there were gaps in test availability. Serum electrolyte tests, useful as part of a metabolic panel and to measure symptoms of heart disease and high blood pressure, were not present at any area hospitals or community health centres, and were available at only 22% of district hospitals. Renal function, liver function, and spinal fluid tests were also rare among facilities below district hospitals. Most facilities were equipped to test for malaria, HIV, and tuberculosis, though availability of these test were lower at primary health centres.





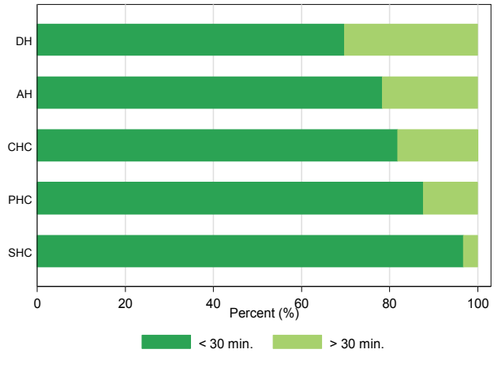
### Facility outputs

Measuring a facility's patient volume and the number of services delivered, which are known as outputs, is critical to understanding how facility resources align with patient demand for care. Figure 8 illustrates the trends in average outpatient volume across platforms and over time. In general, most platforms experienced relatively unchanged levels of outpatient visits over five fiscal years, with slight increases for district hospitals. Patient volume was similar between district (average of 144,069–178,024 visits per year) and area hospitals (average of 142,930–163,587 visits per year). Two district hospitals reported a slight decrease in outpatient visits over the five years of observation. Primary health centres reported more than 10 times more outpatient visits (average of 23,195–26,026 visits per year) than sub-health centres (average of 1,459–1,708 visits per year).

Inpatient visits generally entail more service demands than outpatient visits, including ongoing occupancy of facility resources such as beds. The reported number of inpatient visits (other than deliveries) by year are presented in Figure 9. Over time, the average number of inpatient visits has increased for all platforms. District hospitals provided care for an average of 17,871–26,945 inpatient visits per fiscal year, while area hospitals provided care for about half as many patients (an average of 9,739–11,386 visits per year). Community health centres provided, on average, between 3,287 and 4,633 inpatient visits per year. Primary health centres reported substantially fewer inpatient visits (on average 431–623 visits per year), with seven facilities reporting at least 1,000 inpatient visits in any year. It is important to note that the ABCE Facility Survey did not capture information on the length of inpatient stays, which is a key indicator to monitor and include in future work.

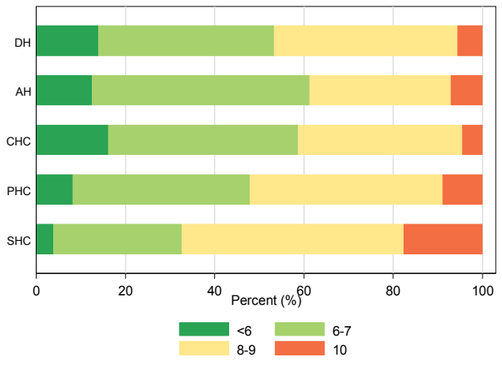
The reported number of deliveries, by platform and over time, is presented in Figure 10. District hospitals reported an average between 1,671 and 2,343 deliveries in each year of observation, which his slightly higher than area hospitals (an average of 1,082–1,299 deliveries per year). While many hospitals experienced an increase in the number of deliveries over time, several hospitals reported decreasing numbers over time. Community health centres reported an annual average number of deliveries

**FIGURE 13** Patient wait times at facilities, by platform




**DH:** District hospital; **AH:** Area hospital; **CHC:** Community health centre; **PHC:** Primary health centre; **SHC:** Sub health centre

**FIGURE 14** Patient scores of facilities, by platform




**DH:** District hospital; **AH:** Area hospital; **CHC:** Community health centre; **PHC:** Primary health centre; **SHC:** Sub health centre

**Note:** Facility ratings were reported along a scale of 0 to 10, with 0 as the worst facility possible and 10 as the best facility possible.

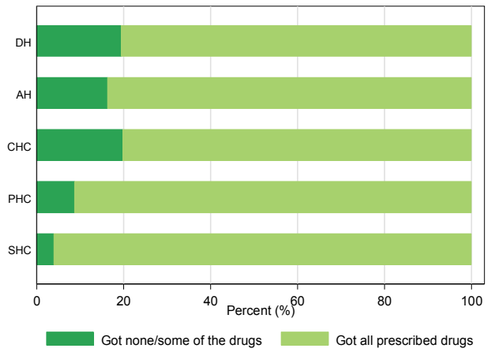
**TABLE 14** Proportion of patients satisfied with facility visit indicators, by platform

| | | DISTRICT HOSPITAL | AREA HOSPITAL | COMMUNITY HEALTH CENTRE | PRIMARY HEALTH CENTRE | SUB HEALTH CENTRE |
|---|---|---|---|---|---|---|
| **Staff interactions** | | | | | | |
| Nurse/ANM | Medical provider respectfulness | 57% | 70% | 51% | 76% | 95% |
| | Clarity of provider explanations | 66% | 67% | 63% | 79% | 93% |
| | Time to ask questions | 65% | 67% | 57% | 78% | 95% |
| Doctor | Medical provider respectfulness | 68% | 75% | 65% | 85% | NA |
| | Clarity of provider explanations | 74% | 76% | 64% | 91% | NA |
| | Time to ask questions | 67% | 70% | 61% | 87% | NA |
| **Facility characteristics** | | | | | | |
| Cleanliness | | 33% | 31% | 39% | 48% | 61% |
| Privacy | | 45% | 35% | 24% | 40% | 52% |

LOWEST AVAILABILITY — HIGHEST AVAILABILITY

**NA:** Results not applicable.

**FIGURE 15** Availability of prescribed drugs at facility, by platform




**DH:** District hospital; **AH:** Area hospital; **CHC:** Community health centre; **PHC:** Primary health centre; **SHC:** Sub health centre

between 362 and 413. Very few deliveries were reported in primary health centres (an average of 62–71 deliveries per year). The ratio of deliveries to inpatient visits is higher among the lower platforms.

### Immunization

The number of immunization doses administered over time, by platform, is presented in Figure 11. Generally, the average number of doses administered remained stable over the five fiscal years. Unlike trends for outpatient visits, inpatient visits, and deliveries, the district hospitals reported far fewer immunization doses administered (annual averages between 9,104 and 10,105) than area hospitals (annual averages between 49,463 and 57,441) and community health centres (annual averages between 31,057 and 37,673). Facilities at the PHC and SHC level are central to immunization delivery; primary health centres reported an average of 7,829–10,366 doses per year while sub health centres reported an average of 753–866 doses per year.





## Patient perspectives

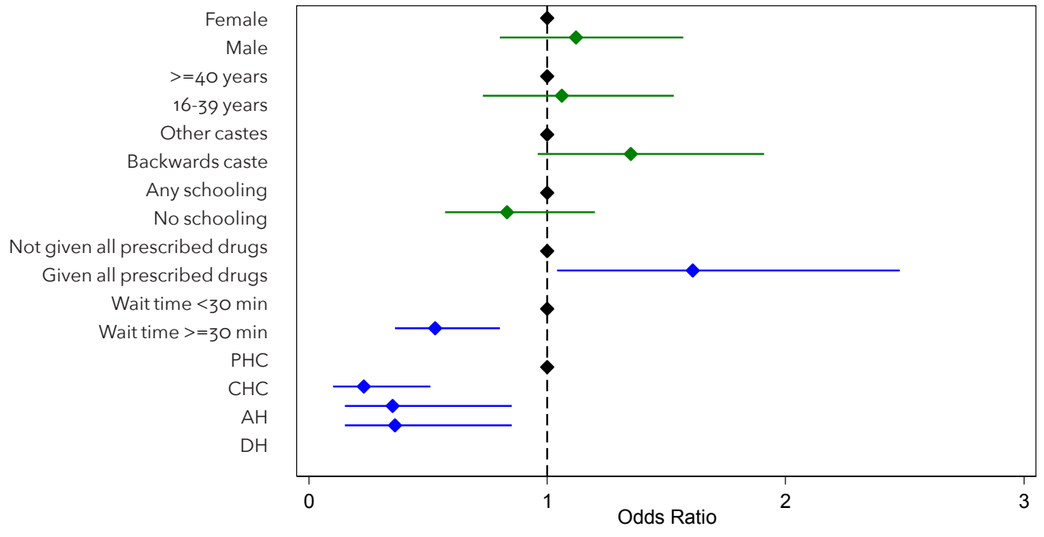
A facility's availability of and capacity to deliver services is only half of the health care provision equation; the other half depends upon patients seeking those health services. Many factors can affect patients' decisions to seek care, ranging from associated visit costs to how patients view the care they receive. These "demand-side" constraints can be more quantifiable (e.g., distance from facility) or intangible (e.g., perceived respectfulness of the health care provider), but each can have the same impact on whether patients seek care at particular facilities or have contact with the health system at all.

Using data collected from the Patient Exit Interview Surveys, we examined the characteristics of patients who presented at health facilities and their perspectives on the care they received. Table 13 provides an overview of the interviewed patients (n=1,198) or their attendants at public facilities. A little over half the patients were men, and with no education. One-fifth of patients were younger than 16 years of age. Across platforms, patient composition was generally comparable. However, patients seeking care at district and area hospitals tended to be more educated than those seeking care at lower-level facilities. The majority of patients at sub-health centres were women (69%).

### Travel and wait times

The amount of time patients spend traveling to facilities and then waiting for services can substantially affect their care-seeking behaviors. Among the patients who were interviewed, we found that travel time to a facility for

**FIGURE 16** Determinants of satisfaction with doctors




Dotted vertical line represents an odds ratio of 1. Black points represent the reference groups, which all carry an odds ratio of 1. Compared to the referent category, significant odds ratios and 95% confidence intervals are represented with blue points and horizontal lines, respectively. Odds ratios that are not significant are represented by green points, and their 95% confidence intervals with a green horizontal line. Any confidence intervals with an upper bound above 3 were truncated for ease of interpretation.

**DH:** District hospital; **AH:** Area hospital; **CHC:** Community health centre; **PHC:** Primary health centre

care (Figure 12) differed by platform, with shorter travel time for patients seeking care at lower-level facilities than higher-level. It is important to note that patients only reported on the time spent traveling to facilities, not the time needed for round-trip visits.

Overall, most patients reported spending less than 30 minutes traveling to the facility at which they sought care. This was particularly pronounced at sub health centres and primary health centres, at which nearly all and over 80% of patients, respectively, indicated that they spent less than 30 minutes traveling to facilities. This finding is not unexpected, as these are the closest health facilities for many patients, particularly those in rural areas. The greatest proportion of patients who spent more time traveling to facilities were found at district and area hospitals, which is not surprising given that many patients will travel long distances to receive the specialized care offered at these hospitals.

In terms of wait time, more than two-thirds of patients waited less than 30 minutes to receive care across all platforms (Figure 13). Nearly all patients seeking care at sub health centres received care within 30 minutes.

## Patient satisfaction with care

We report primarily on factors associated with patient satisfaction with provider care and patients' perceived quality of services including medicine availability and hospital infrastructure, as these have been previously identified to be of significance in the patient's perception of quality of health services in India.[11]

Ratings of patient satisfaction, which were based on a rating from 1 to 10, with 10 being the highest score, are presented in Figure 14. Overall, patients were satisfied with the care they received and, in general, ratings were higher at lower-level platforms. Fewer than 4% of patients receiving care at a sub-health centre gave a rating below 6, while 17% of patients gave a rating of 10.

Table 14 provides a more in-depth examination of patient ratings of facility characteristics and visit experiences. Patients gave considerably low ratings of facility cleanliness and privacy of facilities, with only fewer than half of patients satisfied with these at the level of primary health centre and up.

Three parameters were assessed to document satisfaction with health providers – being respectfully treated by the provider, clarity of explanation provided by the provider, and that provider gave enough time to ask questions about health problem or treatment – using a five-point Likert scale, with the highest ratings of good and very good responses combined as satisfied, and rest as not satisfied. Using the three parameters of satisfaction, a composite satisfaction variable was created separately for doctors and nurses – if a patient reported good/very good with all three parameters, the response was categorized as satisfied.  At all platforms other than sub-health centres, patients receiving care from doctors reported relatively higher levels of satisfaction than those receiving care from nurses and ANMs. Satisfaction with nurse and ANM interactions was higher among patients seeking care at primary health centres and sub health centres than hospitals. Satisfaction with both nurse and doctor interactions were lower for patients seeking care at community health centres than district and area hospitals.

Access to to affordable drugs has been interpreted to be part of the right to health. Among 1,160 patients who were prescribed drugs and attempted to obtain those drugs during the visit, 996 (85.9%) received all prescribed drugs (Figure 15). This ranged from 81% of patients at district hospitals to more than 95% of patients at sub-health centres.

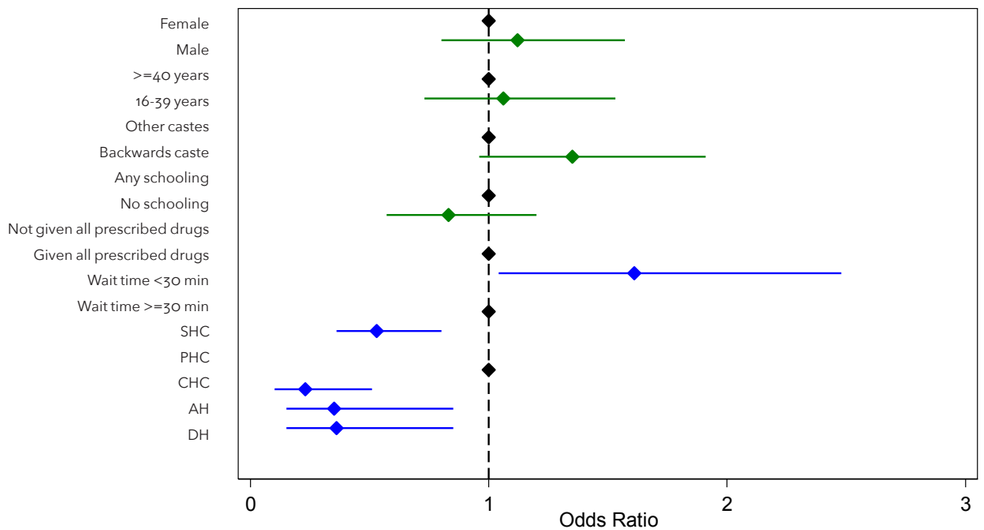
Many complex factors affect patient satisfaction with the medical care they receive. Given this, a multivariate logistic regression was conducted in order to determine which patient and facility characteristics were associated with patient satisfaction with both medical doctors (Figure 16) and nurses/ANMs (Figure 17). For each characteristic – for example, the age or sex of the patient – the odds ratio (OR) is presented. The OR represents the odds that a patient is satisfied given a particular characteristic, compared to the odds of the patient being satisfied in the absence of that characteristic. An OR and 95% confidence interval (CI) greater than 1.0 indicates that there are greater odds of being satisfied with care as compared to the reference group. An OR and 95% CI below 1.0 indicates that there are lower odds of being satisfied with care than the reference group.

For example, while the OR for male patients being satisfied with care from a doctor is 1.12 (95% CI: 0.80–1.57) as compared to female patients, it is not statistically different from an OR of 1.0 (Figure 16). This means that, considering all other characteristics, male patients are not more or less satisfied with care from doctors than female patients. In Figures 16 and 17, ORs that are statistically significant are signified by blue points, with blue horizontal bars representing their confidence interval. ORs that are not statistically significant are represented with green points and green confidence bars.

Longer wait time to receive attention was associated with lower patient satisfaction with doctors (OR: 0.53, 95% confidence interval [CI]: 0.36–0.80). Patients who received all prescribed drugs were more likely to be satisfied with care than those who received none or some

11 Rao KD, Peters DH, Bandeen-Roche K. Towards patient-centreed health services in India–a scale to measure patient perceptions of quality. *International Journal for Quality in Health Care*. 2006; 18(6):414-421.

**FIGURE 17** Determinants of satisfaction with nurses/ANMs




Dotted vertical line represents an odds ratio of 1. Black points represent the reference groups, which all carry an odds ratio of 1. Compared to the referent category, significant odds ratios and 95% confidence intervals are represented with blue points and horizontal lines, respectively. Odds ratios that are not significant are represented by green points, and their 95% confidence intervals with a green horizontal line. Any confidence intervals with an upper bound above 3 were truncated for ease of interpretation.

**DH:** District hospital; **AH:** Area hospital; **CHC:** Community health centre; **PHC:** Primary health centre; **SHC:** Sub health centre





**TABLE 15** Input-output model specifications

| | CATEGORY | VARIABLES |
|---|---|---|
| **Model 1** | Inputs | Expenditure on personnel<br>Expenditure on pharmaceuticals<br>All other expenditure |
| | Outputs | Outpatient visits<br>Inpatients visits (excluding deliveries)<br>Deliveries<br>Immunization visits |
| **Model 2** | Inputs | Number of beds<br>Number of doctors<br>Number of nurses<br>Number of paramedical staff<br>Number of non-medical staff |
| | Outputs | Outpatient visits<br>Inpatients visits (excluding deliveries)<br>Deliveries<br>Immunization visits |

**TABLE 16** Average and range of inputs and outputs, by platform. INR denotes Indian Rupees.

| | | DISTRICT HOSPITAL | AREA HOSPITAL | COMMUNITY HEALTH CENTRE | PRIMARY HEALTH CENTRE |
|---|---|---|---|---|---|
| Inputs | Personnel expenditure (INR) | 49,230,395 (10,745,212–152,830,688) | 24,358,433 (5,257,840–91,644,776) | 6,260,759 (1,724,198–14,196,109) | 3,547,308 (812,954–11,163,012) |
| | Pharmaceutical expenditure (INR) | 6,858,420 (1,754,404–43,038,936) | 2,525,449 (1,152,646–7,138,705) | 892,576 (185,054– 3,527,169) | 345,357 (58,103– 1,154,362) |
| | Other expenditure (INR) | 16,672,097 (560,431–97,932,792) | 1,624,009 (235,904–5,526,153) | 840,145 (35,852–3,764,388) | 287,224 (18,493–1,618,994) |
| | Number of beds | 256 (100–500) | 110 (100–140) | 40 (13–60) | 4 (0–8) |
| | Number of doctors | 21 (6–49) | 13 (3–21) | 6 (3–12) | 2 (0–4) |
| | Number of nurses | 62 (18–108) | 24 (10–36) | 8 (1–16) | 2 (0–5) |
| | Number of paramedical staff | 35 (17–59) | 16 (4–32) | 11 (2–23) | 16 (4–54) |
| | Number of non-medical staff | 39 (13–87) | 13 (2–31) | 5 (1–11) | 2 (0–6) |
| Outputs | Outpatient visits | 169,685 (34,888–338,059) | 151,279 (69,387–328,518) | 61,098 (4,323–145,114) | 29,763 (6,487–86,142) |
| | Inpatient visits (excluding deliveries) | 24,239 (6,048–64,662) | 10,518 (2,838–23,208) | 3,922 (380–9,653) | 588 (0–2,734) |
| | Deliveries | 1,959 (684–4,453) | 1,145 (234–2,506) | 385 (0–2,565) | 79 (0–364) |
| | Immunization doses | 8,469 (2,290–17,722) | 53,382 (1,724–172,726) | 38,950 (478–71,763) | 11,175 (0–64,979) |

of the drugs (OR: 1.61, 95% CI: 1.04–2.48). Compared to patients seeking care at primary health centres, patients were less satisfied with doctors at community health centres (OR: 0.23, 95% CI: 0.10–0.51), area hospitals (OR: 0.35, 95% CI: 0.15–0.85), and district hospitals (OR: 0.36, 95% CI: 0.15–0.85).

Considering all selected patient and facility characteristics, wait time and platform were significantly associated with satisfaction with nurses/ANMs. Patients who had a longer wait time at the facility were less satisfied (OR: 0.45, 95% CI: 0.26–0.76). Compared to sub health centres, there were lower odds of a patient being satisfied with nurses/ANMs at primary health centres (OR: 0.18, 95% CI: 0.07–0.44), community health centres (OR: 0.07, 95% CI: 0.02–0.18), area hospitals (OR: 0.10, 95% CI: 0.02–0.32), and district hospitals (OR: 0.11, 95% CI: 0.04–0.33).

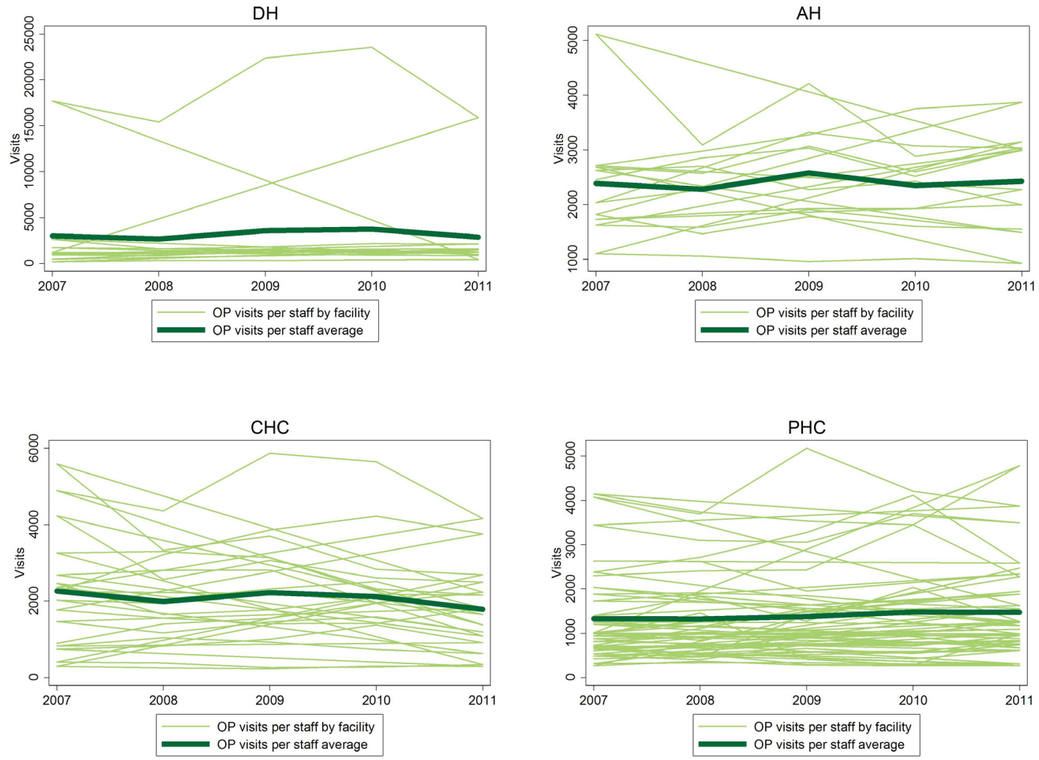
## Efficiency and costs

The costs of health service provision and the efficiency with which care is delivered by health facilities go hand-in-hand. An efficient health facility uses resources well, producing a high volume of patient visits and services without straining its resources. Conversely, an inefficient health facility is one where the use of resources is not





**FIGURE 18** Outpatient load per staff by platform




**DH:** District hospital; **AH:** Area hospital; **CHC:** Community health centre; **PHC:** Primary health centre

**Note:** each line represents an individual facility, with the bolded line depicting the average for the platform. Scales are different for each platform type.

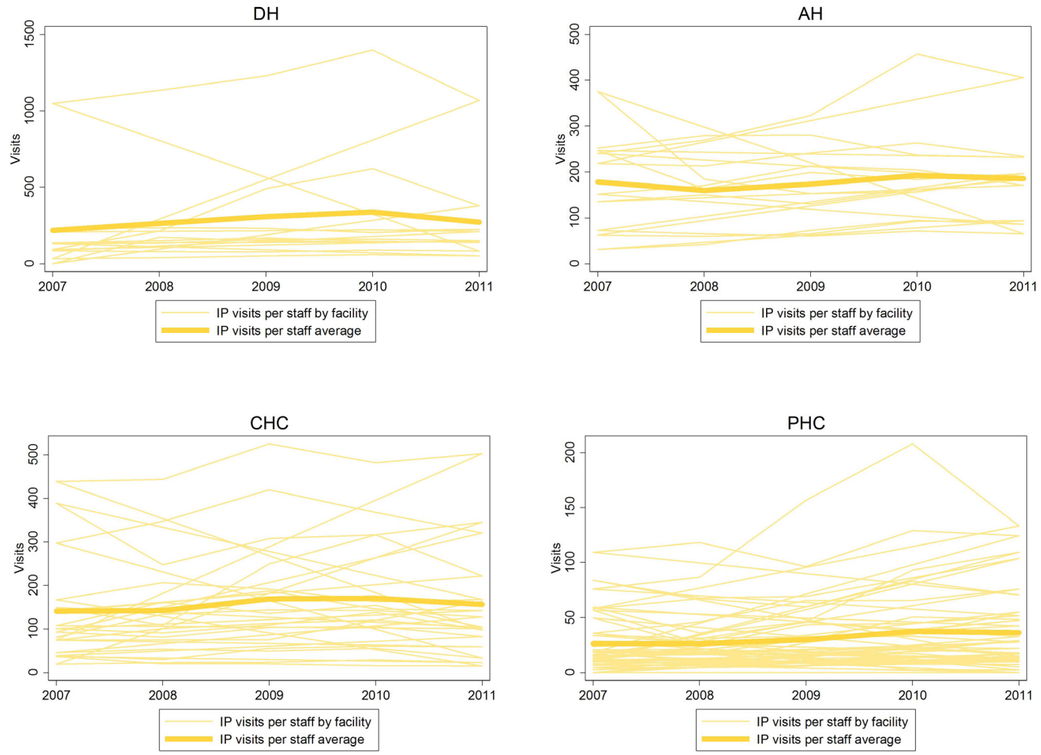
maximized, leaving usable beds empty or medical staff seeing very few patients per day. We present technical efficiency analysis for district hospitals, area hospitals, community health centres and primary health centres.

### Analytical approach

An ensemble model approach was used to quantify technical efficiency in health facilities, combining results from two approaches – the restricted versions of Data Envelopment Analysis (rDEA) and Stochastic Distance Function (rSDF).[12] Based on this analysis, an efficiency score was estimated for each facility, capturing a facility's use of its resources. Relating the outputs to inputs, the rDEA and rSDF approaches compute efficiency scores ranging from 0% to 100%, with a score of 100% indicating that a facility achieved the highest level of production relative to all facilities in that platform.

12 Di Giorgio L, Flaxman AD, Moses MW, Fullman N, Hanlon M, Conner RO, et al. Efficiency of Health Care Production in Low-Resource Settings: A Monte-Carlo Simulation to Compare the Performance of Data Envelopment Analysis, Stochastic Distance Functions, and an Ensemble Model. PLOS ONE. 2016; 11(2): e0150570.

**FIGURE 19** Inpatient load per staff by platform




**DH:** District hospital; **AH:** Area hospital; **CHC:** Community health centre; **PHC:** Primary health centre

**Note:** each line represents an individual facility, with the bolded line depicting the average for the platform. Scales are different for each platform type.

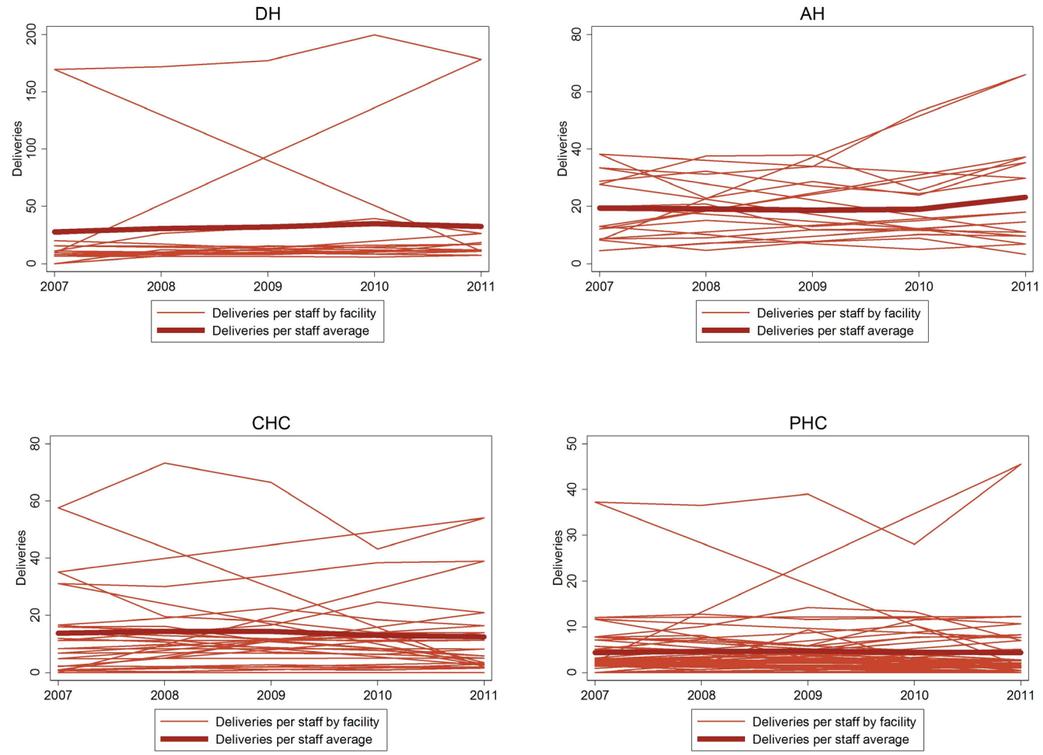
This approach assesses the relationship between inputs and outputs to estimate an efficiency score for each facility. Recognizing that each type of input requires a different amount of facility resources (e.g., on average, an inpatient visit uses more resources and more complex types of equipment and services than an outpatient visit), we applied weight restrictions to rescale each facility's mixture of inputs and outputs. The incorporation of additional weight restrictions is widely used in order to improve the discrimination of the models. Weight restrictions are most commonly based upon the judgment about the importance of individual inputs and outputs, or reflect cost or price considerations. The resulting ensemble efficiency scores were averaged over five years and between the two input models.

For these models, service provision was categorized into outpatient visits, inpatient visits, delivery, and immunization. Two input-output specifications were used, with the inputs being different in the two models. The inputs and outputs are listed in Table 15. The detailed data utilized for this analysis are documented in the annex. The average and range of inputs and outputs for the variables are presented in Table 16.





**FIGURE 20** Deliveries per staff by platform



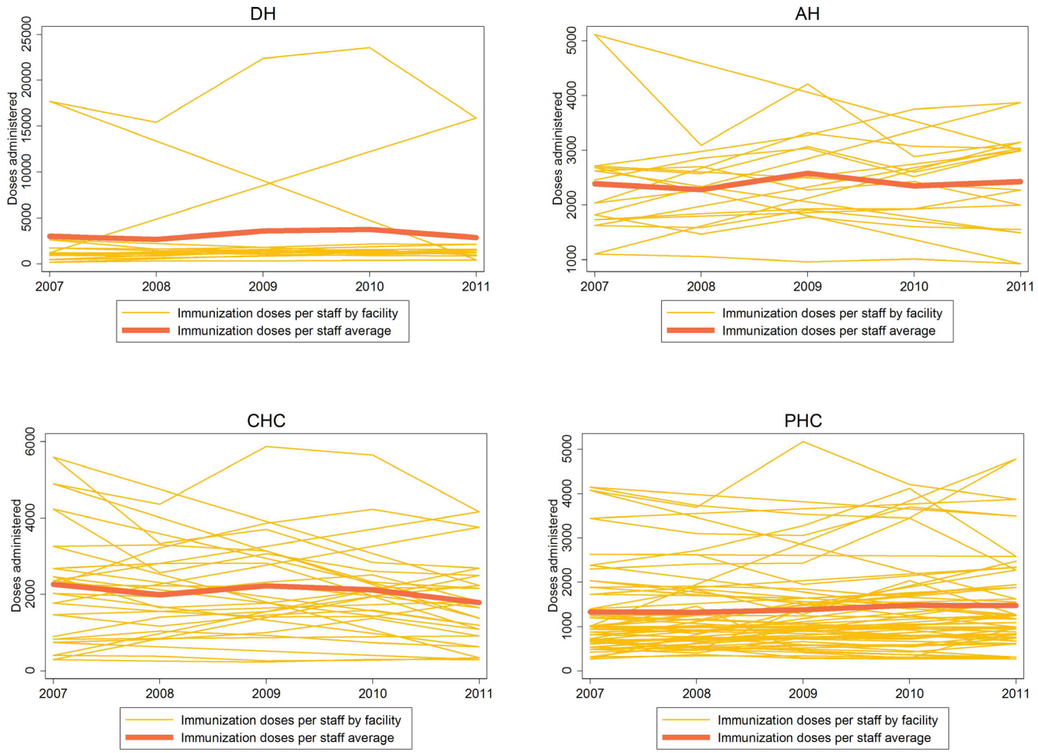

**DH:** District hospital; **AH:** Area hospital; **CHC:** Community health centre; **PHC:** Primary health centre

**Note:** each line represents an individual facility, with the bolded line depicting the average for the platform. Scales are different for each platform type.

It is important to note that data availability on the inputs and output indicators varied across the facilities and platforms, with more non-availability for PHCs. Facilities with five years of missing data for any input or output variable were dropped from analysis. In addition, the data were smoothed where necessary based on the trends seen in inputs or outputs for that facility.

To further illustrate the production of outputs per inputs – in this case, staff – a simple ratio of outpatient visits (Figure 18), inpatient visits (Figure 19), deliveries (Figure 20), and immunization doses (Figure 21) per staff are presented. District hospitals produced an average of 3,139 outpatient visits per staff, though the ratio ranged greatly. The average ratio was 2,407 visits per staff for area hospitals, 2,073 for community hospitals, and 1,394 for primary health centres. This gradient was similar for inpatient visits, with district hospitals providing 279 inpatient visits per staff, area hospitals providing 178, community health centres providing 156, and primary health centres providing 31. The range of inpatient visits per staff was low for primary health centres, where inpatient visits are rare. Overall, as expected, outpatient visits accounted for the

**FIGURE 21** Immunizations per staff per day by platform




**DH:** District hospital; **AH:** Area hospital; **CHC:** Community health centre; **PHC:** Primary health centre

**Note:** each line represents an individual facility, with the bolded line depicting the average for the platform. Scales are different for each platform type.

overwhelmingly large majority of the patients seen per staff per day across the platforms.

Fewer deliveries were performed per staff than other services, with an average of 31 deliveries per staff in district hospitals, 20 per staff in area hospitals, 14 per staff in community health centres, and four per staff in primary health centres. A different pattern emerged for immunization doses: 1,272 doses were administered per staff in community health centres, 837 per staff in area hospitals, 557 per staff in primary health centres, and 207 per staff in district hospitals.

## Efficiency results

Using the five fiscal years of data to estimate the efficiency scores for all facilities, two main findings emerged. First, efficiency scores were relatively low across all health facilities, with 64.9% being the highest mean across platforms. Second, the range between the facilities with highest and lowest efficiency scores was quite large within platforms, suggesting that a substantial performance gap may exist between the average facility and facilities with the highest efficiency scores. Figure 22 depicts this range of facility efficiency scores across platforms for APT.



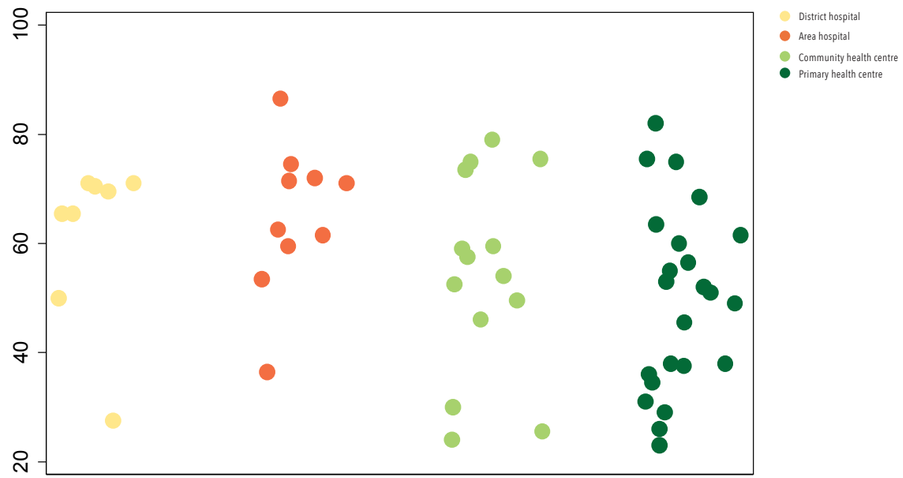


**TABLE 17** District-wise efficiency scores (%), by platform

| DISTRICT/ PLATFORM | DISTRICT HOSPITAL | AREA HOSPITAL | | COMMUNITY HEALTH CENTRE | | PRIMARY HEALTH CENTRE | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 1 | 2 | 1 | 2 | 1 | 2 | 3 | 4 |
| **Andhra Pradesh** | | | | | | | | | |
| District 1 | 71 | 75 | | 60 | 74 | 69 | 64 | 53 | 76 |
| District 2 | 71 | 87 | | 79 | 58 | 82 | 75 | 62 | 49 |
| District 3 | 28 | 37 | | 24 | 46 | 38 | 46 | | |
| District 4 | | 71 | | 54 | 53 | 23 | 35 | 38 | 52 |
| District 8 | 66 | 72 | | 30 | 50 | 57 | 51 | 38 | 26 |
| **Telangana** | | | | | | | | | |
| District 5 | 66 | 72 | 54 | | | | | | |
| District 6 | 50 | 60 | | 26 | | 29 | 31 | | |
| District 7 | 70 | 63 | | 75 | 76 | 36 | 60 | | |
| District 9 | 71 | 62 | | 59 | | 55 | | | |

White cells were either dropped from analysis due to data availability, or there were no more facilities to sample of that platform. For District 5, there were no facilities to sample below AH.

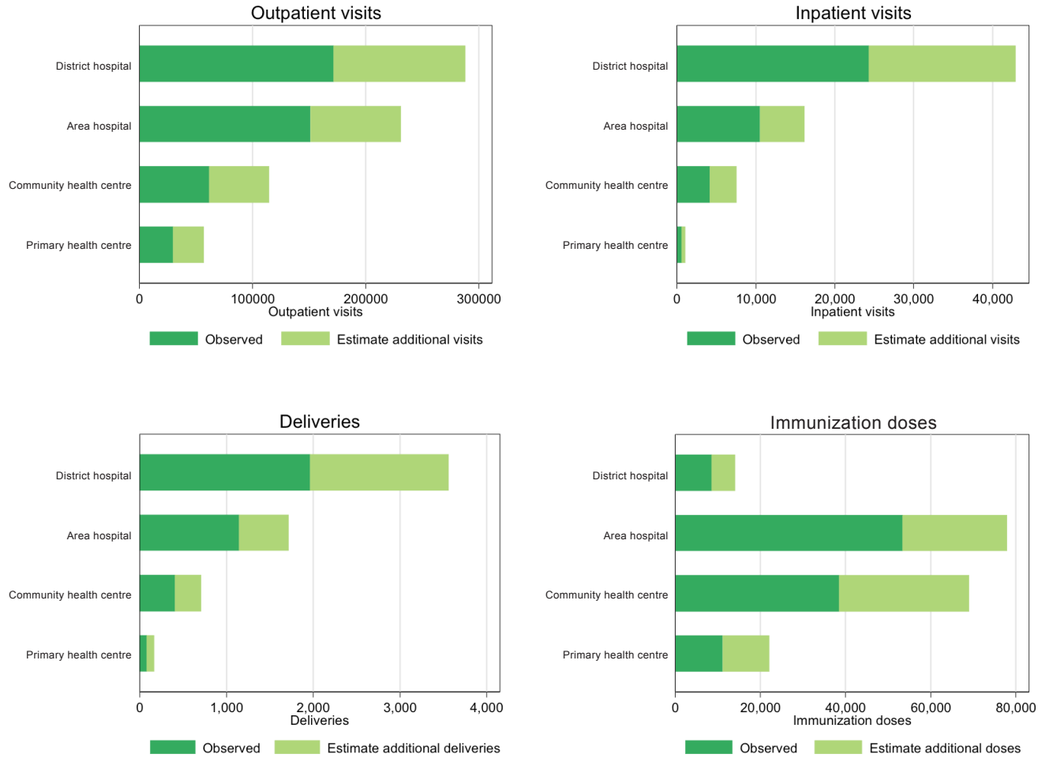
**FIGURE 22** Range of efficiency scores across platforms




| District hospital | Area hospital | Community health centre | Primary health centre |
|---|---|---|---|
| Mean: 61.3 | Mean: 64.9 | Mean: 54.3 | Mean: 49.6 |
| Median: 67.5 | Median: 66.8 | Median: 55.8 | Median: 51.0 |
| IQR: 57.8-70.8 | IQR: 59.5-72.0 | IQR: 46.0-73.5 | IQR: 36.0-61.5 |

**Note:** Each circle represents the five-year facility average efficiency score; IQR refers to intra-quartile range.

**FIGURE 23** Observed and estimated additional visits that could be produced given observed facility resources




The five-year average efficiency of district hospitals ranged from 28% to 71%, with a platform average of 61%. Area hospitals were between 37% and 87% efficient. Community health centres were between 24% and 79% efficient; four facilities were less than 50% efficient and three facilities were 75% or more efficient. The range of efficiency scores was widest for primary health centres, from 23% to 82%, with 11 facilities at less than 50% efficient.

Efficiency by district is presented in Table 17. There is variation in facility efficiency both between and within districts. All community health centres and primary health centres in District 3 and District 6 were similarly less than 50% efficient; however, the area hospital in District 6 was 60% efficient while the area hospital in District 3 was only 37% efficient. While one primary health centre in District 2 was 82% efficient, another was only 49% efficient.

Given observed levels of facility-based resources (beds and personnel), it would appear that many facilities had the capacity to handle much larger patient volumes than they reported. Figure 23 displays this gap in potential efficiency performance across platforms, depicting the possible gains in total service provision that could be achieved if every facility in the ABCE sample operated at optimal efficiency.

We found that all types of facilities could expand their outputs substantially given their observed resources. Based on our analyses, the highest level of care, district hospitals, had the greatest potential for increasing service





**TABLE 18** Average annual cost in INR, by district and platform, last fiscal year. INR denotes Indian Rupees.

| DISTRICT | DISTRICT HOSPITAL | AREA HOSPITAL | COMMUNITY HEALTH CENTRE | PRIMARY HEALTH CENTRE |
|---|---|---|---|---|
| **Andhra Pradesh** | | | | |
| District 1 | 46,871,096 | 53,261,192 | 11,358,760 | 5,063,364 |
| District 2 | 84,172,424 | 43,671,020 | 13,085,874 | 5,764,821 |
| District 3 | 97,074,352 | 26,360,026 | 12,232,964 | 8,834,275 |
| District 4 | | 21,368,628 | 10,628,410 | 5,658,938 |
| District 8 | 125,833,816 | 47,033,808 | | |
| **Telangana** | | | | |
| District 5 | 189,286,192 | 13,155,454 | 9,995,043 | 5,182,676 |
| District 6 | 80,054,728 | 28,779,546 | 12,843,085 | 6,885,115 |
| District 7 | 202,479,888 | 14,318,990 | 10,559,072 | 5,539,970 |
| District 9 | 26,582,862 | 97,807,664 | 7,278,418 | 2,661,053 |

**FIGURE 24** Average total and type of expenditure, by platform, 2007–2011

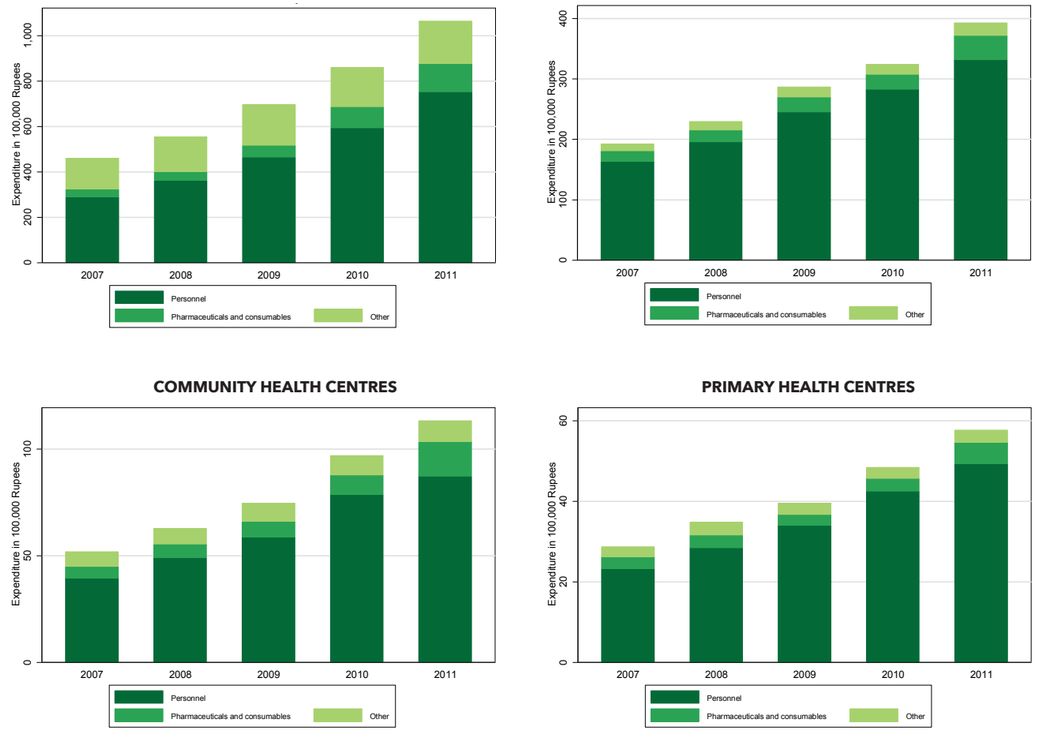
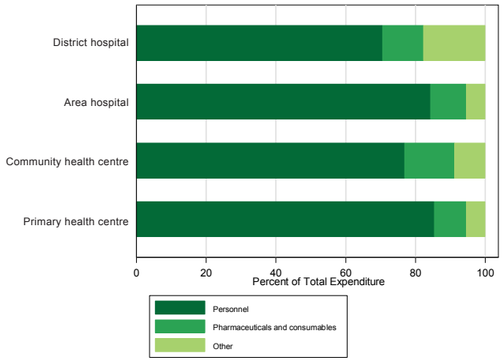


**FIGURE 25** Average percentage of expenditure type, by platform, in 2011




provision without expanding current resources. Overall, based on our estimation of efficiency, a large portion of APT health facilities could increase the volume of patients seen and services provided with the resources available to them.

On average, district hospitals could provide 116,316 additional outpatient visits with the same inputs, while primary health centres could see 27,144 additional outpatient visits. Community health centres could administer an average of 30,502 additional immunization doses with the same inputs if all facilities were efficient.

At the same time, many reports and policy documents emphasize that pronounced deficiencies in human resources for health exist across India in the public sector health system, such that "significant [human resources for health] will be required to meet the demand" for health services.[13] Our results suggest otherwise, as most facilities in the ABCE sample had the potential to bolster service production given their reported staffing of skilled personnel and physical capital.

These findings provide a data-driven understanding of facility capacity and how health facilities have used their resources in APT; at the same time, they are not without limitations. Efficiency scores quantify the relationship between what a facility has and what it produces, but these measures do not fully explain where inefficiencies originate, why a given facility scores higher than another, or what levels of efficiency are truly ideal. It is conceivable that always operating at full capacity could actually have negative effects on service provision, such as longer wait times, high rates of staff burnout and turnover, and compromised quality of care. These factors, as well as less tangible characteristics such as facility management, are all important drivers of health service provision, and future work should also assess these factors alongside measures of efficiency.

## Costs of care

Total expenditure, by district and platform, is presented in Table 18. In terms of annual total expenditures, trends in average facility spending varied by platform between 2007 and 2011 (Figure 24). All platforms recorded slightly higher levels of average expenditures in 2011 than in 2007, which appeared to be driven by increased spending on medical supplies and personnel. Figure 25 shows the average composition of expenditure types across platforms for 2011. Notably, area hospitals and PHCs spent a slightly greater proportion of their total expenditures on personnel than other platforms. On the other hand, expenditures on medical supplies were the most at CHCs with other expenditure being more in the district hospitals for the largest proportion of private facilities' total spending.

13 Rao M, Rao KD, Kumar AK, Chatterjee M, Sundararaman T. Human resources for health in India. The Lancet. 2011; 377(9765): 587-98.

# Conclusions and policy implications

To achieve its mission to "expand the reach of health care and establishing universal health coverage,"[1] India has strived over the past 10 years to expand and strengthen the public sector of health care, with a focus on reaching rural areas. The country recognizes disparities and has sought to enact policies and implement programs to expand access to essential and special services for marginalized groups. Our findings show that these goals are ambitious but attainable, if the country focuses on rigorously measuring health facility performance and costs of services across and within levels of care, and if it can align the different dimensions of health service provision to support optimal health system performance.

## Facility capacity for service provision

Optimal health service delivery, one of the key building blocks of the health system,[2] is linked to facility capacity to deliver the services needed by individuals and additionally render adequate demand for services. With the appropriate balance of skilled staff and supplies to offer essential and special health services, a health system has the foundation needed to deliver quality, equitable health services.[3,4]

The availability of a subset of services (e.g., birth attendance, antenatal care, general medicine, and laboratory services) was generally reasonable across facility types in Andhra Pradesh and Telangana as relevant to that platform. This broad access reflects an expansion of these services throughout the state. However, there were disparities in availability of services offered between high- and lower-level platforms, namely, DOTS and HIV treatment, and immunization services were less available at community health centres. High-level facilities are tasked with providing secondary care, but also offer essential services. However, many of these facilities were not adequately supplied to provide such services. Within these states, not all district hospitals (88%) reported providing DOTS treatment for tuberculosis and STI treatment, both of which are considered essential services.

Chronic diseases (e.g., cardiovascular diseases, mental health disorders, diabetes, and cancer) and injuries, which are the leading causes of death and disability in India, are projected to increase in their contribution to the burden of disease during the next 25 years.[5,6,7] Much of the care for chronic diseases and injuries is provided in the private sector and can be very expensive. These study findings also document notably lacking NCD-related services from all levels of care, including cardiology, psychiatry, and chemotherapy. Only 25% of the district hospitals provide cardiology services, and only 50% report providing psychiatric care. Such gaps in the health system will exacerbate disparities by not dealing appropriately with NCDs while continuing to endeavor to eliminate major infectious diseases like tuberculosis, HIV, and malaria, or to reduce neonatal and infant mortality. Furthermore, there also is a paucity of essential equipment for NCD services, including glucometer/test strips and blood chemistry analyzers. Functional ultrasound machines were present at all district hospitals and most area hospitals (90%). Furthermore, though functional CT scans are considered essential, they were not available at any area hospital. These findings support the need for immediate action to scale up interventions for chronic diseases through improved public health and primary health care systems that are essential for the implementation of cost-effective interventions.

1 Planning Commission Government of India. *Twelfth Five Year Plan (2012-17)*. New Delhi, India: Government of India, 2012.
2 World Health Organization (WHO). *Everybody's Business: Strengthening health systems to improve health outcomes: WHO's Framework for Action*. Geneva, Switzerland: WHO, 2007.
3 Balarajan, Y, Selveraj, S, Subramanian, SV. Health care and equity in India. The Lancet. 2011; 377: 505-515.
4 Rao M, Rao KD, Kumar AK, Chatterjee M, Sundararaman T. Human resources for health in India. The Lancet. 2011; 377(9765): 587-98.
5 GBD 2015 Mortality and Causes of Death Collaborators. Global, regional, and national life expectancy, all-cause mortality, and cause-specific mortality for 249 causes of death, 1980–2015: a systematic analysis for the Global Burden of Disease Study 2015. The Lancet. 2016; 388:1459–1544.
6 Patel V, Chatterji S, Chisholm D, Ebrahim S, Gopalakrishna, G, Mathers C et al. Chronic diseases and injuries in India. The Lancet. 2011; 377: 413-28.
7 GBD 2015 DALYs and HALE Collaborators. Global, regional, and national disability-adjusted life-years (DALYs) for 315 diseases and injuries and healthy life expectancy (HALE), 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015. The Lancet. 2016 Oct 7; 388:1603–1658.





India has a severe shortage of human resources for health. It has a shortage of qualified health workers and the workforce is concentrated in urban areas. In the context of a shortage of qualified health personnel at all levels of the health system, but especially rural areas,[8,9,10] results reveal disparate staffing patterns between facilities. Hospitals employ a large number of staff. At the lower, community levels, paramedical staff including nurses and ANMs provide the majority of care to patients (based on reported staffing). These staffing patterns are not unexpected, as this is the hierarchy of care. However, nurses do not have much authority or say within the health system, and the resources to train them are still inadequate. A call has been made to the government to urgently address the issues of human resources through a comprehensive national policy for human resources to achieve universal health care in India. However, it should be noted that despite the shortfall in human resources, the study findings suggest suboptimal efficiency in production of services with the given level of human resources.

## Infrastructure and equipment

Adequate operational equipment and infrastructure are essential for the functioning of a facility, which affects the efficiency of service provision. In these states, all facilities but sub-health centres had access to a functioning electricity. Furthermore, no facilities reported being solely dependent on a generator. This means that the quality of health services is elevated across the states, with more reliable storage of medications, vaccines, and laboratory samples.

Most surveyed facility types except for sub-health centres reported flush toilets. However, access to piped water was more variable. While all district hospitals, 90% of area hospitals, and 88% of community health centres reported having piped water, fewer than 78% of primary health centres and 38% of sub-health centres reported having this resource. India's Twelfth Five Year Plan recognizes the necessity of access to clean water and sanitation in the control of disease, and states that increased resource allocation to ensure this from the public health sector is necessary.[11] Despite findings that indicate lower-level facilities have less access to water and sanitation, the study found that many facilities did have these essential resources, likely reflecting India's commitment[12,13] to upgrade all facilities so they meet Indian Public Health Standards.

Based on WHO equipment guidelines,[14] district hospitals generally reported high availability of basic medical equipment and equipment to perform routine delivery care. However, they, and all other lower health facilities, reported depressed availability of basic lab equipment. Few facilities across all platforms reported being fully equipped for delivery services, though 94% to 100% of facilities reported providing delivery services. Similarly, few facilities (fewer than 67% DHs and 30% for all other facility types) across all platforms reported being fully equipped for antenatal care services, though all facilities reported providing these services. Equipment for blood tests and functional equipment to perform general surgery were highest at district hospitals. At least 80% of area and district hospitals had each of the essential items for these services, but availability was considerably less at lower-level health facilities. There are large gaps in equipment and testing availability across all platforms; improving availability of these items could improve the quality of care provided. This is especially true for essential medical equipment to diagnose and treat non-communicable conditions.

## Facility production of health services

Overall, the number of outpatient visits by year and platform was stable over the five years of observation. District hospitals have slightly increased their volume of visits. Outpatient visits were considerably lower at the lower health facilities. The volume of inpatient visits and

8 Planning Commission Government of India. *Twelfth Five Year Plan (2012-17)*. New Delhi, India: Government of India, 2012.
9 Hazarika I. Health Workforce in India: Assessment of Availability, Production and Distribution. WHO South East Asia Journal of Public Health. 2013; 2(2): 106-112.
10 Rao M, Rao KD, Kumar AK, Chatterjee M, Sundararaman T. Human resources for health in India. The Lancet. 2011; 377(9765): 587-98.
11 Planning Commission Government of India. *Twelfth Five Year Plan (2012-17)*. New Delhi, India: Government of India, 2012.
12 Planning Commission Government of India. *Eleventh Five Year Plan (2007-12)*. New Delhi, India: Government of India, 2007.
13 Planning Commission Government of India. *Twelfth Five Year Plan (2012-17)*. New Delhi, India: Government of India, 2012.
14 World Health Organization (WHO). *Service Availability and Readiness Assessment (SARA) Reference Manual*. Geneva, Switzerland: WHO, 2015.

deliveries increased over the five years of observation for all platforms. The highest volumes of visits were held by district hospitals, followed by area hospitals. Facility expenditure is dominated by personnel costs – accounting for, on average, at least 70% of total costs.

Efficiency scores reflect the relationship between facility-based resources and the facility's total patient volume each year. Average efficiency scores by platform ranged from 49.6% to 64.9%, indicating patient volume could substantially increase with the observed levels of resources and expenditure. Within each platform, there is great variation in the efficiency of health facilities between and within districts. With this information, we estimated that facilities could substantially increase the number of patients seen and services provided based on their observed levels of medical personnel and resources in 2011. As India seeks to strengthen public-sector care to reduce the heavy burden of out-of-pocket expenditures,[15,16] stakeholders may seek to increase efficiency by providing more services while maintaining personnel, capacity (beds), and expenditure.

Further use of these results requires considering efficiency in the context of several other factors, including quality of care provided, demand for care, and expediency with which patients are seen.

The policy implications of these efficiency results are both numerous and diverse, and they should be viewed with a few caveats. A given facility's efficiency score captures the relationship between observed patient volume and facility-based resources, but it does not reflect the expediency with which patients are seen, the optimal provision of services,, demand for the care received, and equity in provision of services to serve those who are disadvantaged.[17]. These are all critical components of health service delivery, and they should be thoroughly considered alongside measures of efficiency. On the other hand, quantifying facility-based levels of efficiency provides a data-driven, rather than strictly anecdotal, understanding of how much APT health facilities could potentially expand service provision without necessarily increasing personnel or bed capacity in parallel.

15 Planning Commission Government of India. *Twelfth Five Year Plan (2012-17).* New Delhi, India: Government of India, 2012.
16 Kumar AKS, Chen LC, Choudhury M, Ganju S, Mahajan V, Sinha A et al. Financing health care for all: challenges and opportunities. The Lancet. 2011; 377: 668-79.
17 UNICEF. Narrowing the gaps: *The power of investing in the poorest children.* New York, NY: UNICEF, 2017

## Costs of care

Average facility expenditure per year differed substantially across platforms. We were unable to estimate the costs of care by type of services (such as outpatients, inpatients, deliveries, immunization, etc.) or by type of disease/condition (such as TB, diabetes, etc.) as such data are not readily available at the facilities. Estimating such costs of care and identifying differences in patient costs across the type of platforms is critical for isolating areas to improve cost-effectiveness and expand less costly services, especially for hard-to-reach populations.

Nevertheless, these results on expenditures offer insights into each state's health financing landscape, a key component to health system performance in terms of cost to facilities and service production. While these costs do not reflect the quality of care received or the specific services provided for each visit, they can enable a compelling comparison of overall health care expenses across states within India. Future studies should aim to capture information on the quality of services provided, as it is a critical indicator of the likely impact of care on patient outcomes.

## Patient perspectives

Patient satisfaction is an important indicator of patient perception of the quality of services provided by the health care sector.[18,19] Evaluation of services by patients is important for purposes of monitoring, increasing accountability, recognizing good performance, and adapting patient-centric services, and for utilization of services and compliance to treatment. This report examined patient perspectives at public facilities; a major strength of this study is that patient satisfaction was assessed across the various levels of public sector health care in both the states.

The public health system in India was designed as a referral hierarchical system to provide a continuum of health care, and as a consequence of this, failure at one level can impact the chain of care at another level.[20] Although various government initiatives have led to

18 Mpinga EK, Chastonay P. Satisfaction of patients: a right to health indicator? *Health Policy*. 2011; 100(2-3):144-150.
19 Baltussen RM, Yé Y, Haddad S, Sauerborn RS. Perceived quality of care of primary health care services in Burkina Faso. *Health Policy Plan*. 2002; 17: 42-48.
20 National Health Mission, Ministry of Health and Family Welfare, Government of India. *Framework for Implementation National Health Mission (2012-2017).* New Delhi, India: Government of India, 2012.





improved basic service delivery at primary care health facilities over the last few years, still a large number of patients directly visit higher-level facilities, leading to overcrowding of those facilities,[21] which impacts quality of care as it stretches facility resources in terms of both infrastructure and staff. In addition, the persistent shortage of medical staff in public facilities only aggravates the crowded condition at these facilities.[22]

Findings indicate that patients were generally satisfied with the care they received, and ratings and satisfaction were highest at the lowest levels of care. Overall, patients who rated interactions with doctors reported relatively higher levels of satisfaction about respectfulness, clarity, and time than those receiving care from nurses and ANMs. However, most were not satisfied with the cleanliness of or privacy at the facility. Holding other factors constant, patients with wait times longer than 30 minutes to see health providers were less satisfied with care from either doctors or nurses/ANMs.

In general, patients experienced short travel time to the facility and short wait times at the health facility. Wait time to see the health provider and type of platform at which care was sought were significantly associated with the level of patient satisfaction. Most patients travelled fewer than 30 minutes to receive care, with patients at lower-level facilities reporting the shortest wait times.

Finally, fewer than 20% of patients at district and area hospitals, and community health centres, reported being unable to acquire prescribed drugs. At primary health centres and sub-health centres, fewer than 10% of patients reported that they were unable to receive prescribed drugs. Though these levels are encouraging, ensuring that all patients may obtain prescribed medications at the time of their visit should be a priority, as it facilitates adherence and continuity of care.[23,24,25]

With the developmental priorities for the government of India clearly highlighting the need to increase user participation in health care service delivery for better accountability,[26] understanding how patients perceive the quality of the existing public health services encompassing various dimensions of care such as time to receive medical attention and staff behavior could contribute to developing strategies to improve performance and utilization of the public health system.[27]

21 Bajpai V. The Challenges Confronting Public Hospitals in India, Their Origins, and Possible Solutions. *Advances in Public Health 2014*; 2014: 27.
22 Rao M, Rao KD, Kumar AK, Chatterjee M, Sundararaman T. Human resources for health in India. *The Lancet*. 2011; 377(9765): 587-98.
23 Grover A, Citro B. India: Access to affordable drugs and the right to health. *The Lancet*. 2011; 377: 976-977.
24 World Health Organization (WHO). Equitable access to essential medicines: a framework for collective action. Geneva, Switzerland: WHO, 2004.
25 Reddy, KS, Patel V, Jha P, Paul VK, Kumar AK, Dandona, L. Towards achievement of universal health care in India by 2020: a call to action. *The Lancet*. 2011: 377: 1154.

## Health information system

This study was dependent on the data availability at the facilities for the various inputs and outputs. Because of the vast extent of data that were collected for five financial years across the facilities, there are several lessons regarding the common bottlenecks within the health information system, both at the facility level and at the state level. In general, there is weak staff capacity for data capture and data management and use (interpretation or planning) at all levels. No system of regular review of data at the facility level that could guide planning or improvement of service provision was observed.

It is not possible to assess the outputs by disease/condition other than for deliveries, as data are not captured or collated by disease groups at the facilities. At the higher-level facilities, collation of data on patients seen at the facilities was not readily available, and it was not possible to assess the level of duplication of patients across the departments. Furthermore, documentation of patients as a new patient or a follow-up patient was neither standardized nor practiced across most health facilities. Therefore, data interpretation is possible only in terms of number of visits and not in terms of number of patients.

Data were either incomplete or inaccurate at some facilities for expenditure, patient-related outputs, and staff numbers. In general, the expenditure documentation had the most bottlenecks with these data available across various sources for a given facility. For example, it is not possible to document the expenditures at a given facility without procuring relevant data from the facility, a higher level of facility (block level), district health society, and at times from the state. The most limited capacity was to capture the expenditure on drugs, medical consumables, and supplies.

26 Planning Commission, Government of India. *Faster, sustainable and more inclusive growth: An approach to the Twelfth Five Year Plan*. New Delhi, India: Government of India, 2012.
27 World Health Organization (WHO). *Global Health Observatory Data Repository*. Geneva, Switzerland: WHO, 2016.

## Summary

The ABCE project was designed to provide policymakers and funders with new insights into health systems and to drive improvements. We hope these findings will not only prove useful to policymaking in the two states, but will also inform broader efforts to mitigate factors that impede the equitable access or delivery of health services in India. It is with this type of information that the individual building blocks of health system performance, and their critical interaction with each other, can be strengthened. More efforts like the ABCE project in India are needed to continue many of the position trends highlighted in this report and overcome the identified gaps. Analyses that take into account a broader set of the state's facilities, including private facilities, may offer an even clearer picture of levels and trends in capacity, efficiency, and cost. Continued monitoring of the strength and efficiency of service provision is critical for optimal health system performance and the equitable provision of cost-effective interventions throughout the states and in India.

# Annex:
## Facility-specific data utilized for the efficiency analysis.

Please note that data may be missing for some years across the facilities based on availability of data.
**DH:** District hospital; **AH:** Area hospital; **CHC:** Community health centre; **PHC:** Primary health centre

| FACILITY INFORMATION | | | | INPUTS (BEDS & STAFF) | | | | |
|---|---|---|---|---|---|---|---|---|
| District | Platform | Facility | Year | Beds | Doctors | Nurses | Para-medical | Non-medical |
| 1 | DH | 1 | 2008 | 100 | 11 | 23 | 42 | 13 |
| 1 | DH | 1 | 2009 | 100 | 15 | 18 | 43 | 13 |
| 1 | DH | 1 | 2010 | 100 | 12 | 30 | 42 | 13 |
| 1 | DH | 1 | 2011 | 100 | 11 | 29 | 40 | 13 |
| 1 | AH | 1 | 2007 | 100 | 11 | 22 | 20 | 7 |
| 1 | AH | 1 | 2008 | 100 | 10 | 22 | 21 | 7 |
| 1 | AH | 1 | 2009 | 100 | 11 | 22 | 20 | 7 |
| 1 | AH | 1 | 2010 | 100 | 12 | 22 | 23 | 7 |
| 1 | AH | 1 | 2011 | 100 | 12 | 22 | 23 | 7 |
| 1 | CHC | 1 | 2007 | 30 | 3 | 6 | 5 | 4 |
| 1 | CHC | 1 | 2008 | 30 | 3 | 5 | 7 | 4 |
| 1 | CHC | 1 | 2009 | 30 | 4 | 6 | 8 | 4 |
| 1 | CHC | 1 | 2010 | 30 | 5 | 5 | 8 | 4 |
| 1 | CHC | 1 | 2011 | 30 | 5 | 6 | 9 | 4 |
| 1 | PHC | 1 | 2007 | 4 | 2 | 3 | 11 | 2 |
| 1 | PHC | 1 | 2008 | 4 | 2 | 4 | 10 | 1 |
| 1 | PHC | 1 | 2009 | 4 | 2 | 4 | 9 | 2 |
| 1 | PHC | 1 | 2010 | 4 | 1 | 4 | 8 | 2 |
| 1 | PHC | 1 | 2011 | 4 | 0 | 4 | 5 | 2 |
| 1 | PHC | 2 | 2007 | 6 | 1 | 1 | 50 | 4 |
| 1 | PHC | 2 | 2008 | 6 | 1 | 1 | 53 | 4 |
| 1 | PHC | 2 | 2009 | 6 | 1 | 0 | 53 | 4 |
| 1 | PHC | 2 | 2010 | 6 | 1 | 1 | 53 | 3 |
| 1 | PHC | 2 | 2011 | 6 | 1 | 1 | 54 | 2 |
| 1 | CHC | 2 | 2007 | 15 | 5 | 5 | 20 | 3 |
| 1 | CHC | 2 | 2008 | 15 | 6 | 6 | 20 | 3 |
| 1 | CHC | 2 | 2009 | 15 | 6 | 6 | 21 | 3 |
| 1 | CHC | 2 | 2010 | 15 | 5 | 5 | 22 | 3 |
| 1 | CHC | 2 | 2011 | 15 | 5 | 6 | 23 | 3 |



| OUTPUTS | | | | EXPENDITURE | | | | |
|---|---|---|---|---|---|---|---|---|
| Outpatient | Inpatient | Vaccinations | Births | Personnel | Infrastructure + Utilities | Medical supplies + pharmaceuticals | Administration and training | Non-medical |
| 96,116 | 20,905 | 5,072 | 1,528 | 25,227,144 | 807,384 | 1,954,193 | 28,211 | 400,745 |
| 100,064 | 20,511 | 4,536 | 1,181 | 28,538,480 | 903,912 | 1,957,788 | 51,788 | 224,353 |
| 123,973 | 19,767 | 3,832 | 812 | 35,756,104 | 901,851 | 29,804,130 | 30,906 | 463,880 |
| 116,069 | 20,676 | 3,839 | 999 | 39,633,488 | 1,192,556 | 5,421,093 | 55,982 | 567,976 |
| 147,398 | 15,103 | 5,426 | 1,726 | 12,299,214 | 701,050 | 1,941,617 | 107,132 | 719,750 |
| 171,312 | 16,774 | 6,382 | 1,935 | 15,155,077 | 767,470 | 1,956,892 | 41,855 | 1,250,628 |
| 182,240 | 16,855 | 5,398 | 1,630 | 22,448,450 | 664,101 | 2,342,732 | 94,046 | 1,805,901 |
| 161,266 | 15,155 | 5,448 | 1,566 | 34,832,744 | 473,448 | 3,556,179 | 31,901 | 1,934,084 |
| 192,313 | 14,847 | 5,377 | 1,911 | 42,828,676 | 821,400 | 4,906,364 | 63,975 | 4,640,777 |
| 16,050 | 1,461 | 53,305 | 214 | 2,375,792 | 23,896 | 434,250 | 3,768 | 8,188 |
| 26,551 | 2,542 | 50,025 | 202 | 3,337,247 | 28,645 | 500,000 | 5,212 | 2,105 |
| 34,047 | 3,154 | 50,966 | 158 | 4,601,648 | 53,501 | 535,896 | 14,330 | 5,727 |
| 42,799 | 3,134 | 71,432 | 139 | 5,913,658 | 63,135 | 746,232 | 42,477 | 2,208 |
| 25,987 | 3,058 | 59,293 | 197 | 7,097,071 | 248,198 | 1,383,203 | 51,398 | 42,563 |
| 41,334 | 425 | 31 | 15 | 2,066,407 | 22,182 | 240,061 | 16,633 | 12,116 |
| 40,894 | 472 | 80 | 38 | 2,260,496 | 20,759 | 257,623 | 20,200 | 13,100 |
| 41,288 | 786 | 69 | 47 | 2,923,131 | 20,083 | 250,165 | 20,085 | 15,950 |
| 51,695 | 1,398 | 57 | 34 | 2,840,710 | 19,283 | 215,305 | 22,275 | 29,784 |
| 52,576 | 1,201 | 49 | 29 | 2,783,856 | 19,683 | 338,945 | 26,320 | 52,790 |
| 56,173 | 573 | 13,848 | 121 | 1,750,388 | 108,947 | 288,684 | 154,741 | 130,641 |
| 53,909 | 701 | 14,573 | 144 | 2,821,530 | 94,447 | 309,183 | 118,625 | 47,000 |
| 54,148 | 526 | 16,724 | 146 | 2,873,565 | 94,597 | 332,492 | 99,490 | 88,500 |
| 59,771 | 481 | 14,737 | 108 | 3,810,561 | 78,570 | 163,445 | 70,000 | 99,080 |
| 63,320 | 817 | 11,963 | 122 | 4,922,720 | 72,447 | 422,033 | 206,303 | 126,700 |
| 81,175 | 1,502 | 45,849 | 275 | 6,209,196 | 60,742 | 313,836 | 11,350 | 2,150 |
| 57,723 | 1,874 | 27,995 | 342 | 7,253,052 | 60,972 | 336,652 | 10,540 | 3,032 |
| 63,550 | 1,762 | 33,099 | 316 | 10,303,458 | 63,304 | 218,851 | 12,015 | 4,180 |
| 73,490 | 1,936 | 41,631 | 270 | 10,494,324 | 71,209 | 200,214 | 14,250 | 5,000 |
| 50,918 | 1,226 | 36,303 | 215 | 13,272,456 | 81,592 | 519,096 | 14,942 | 7,000 |

| FACILITY INFORMATION | | | | INPUTS (BEDS & STAFF) | | | | |
|---|---|---|---|---|---|---|---|---|
| District | Platform | Facility | Year | Beds | Doctors | Nurses | Para-medical | Non-medical |
| 1 | PHC | 3 | 2007 | 5 | 2 | 1 | 38 | 4 |
| 1 | PHC | 3 | 2008 | 5 | 2 | 1 | 36 | 4 |
| 1 | PHC | 3 | 2009 | 5 | 2 | 1 | 40 | 4 |
| 1 | PHC | 3 | 2010 | 5 | 2 | 1 | 42 | 4 |
| 1 | PHC | 3 | 2011 | 5 | 2 | 1 | 42 | 4 |
| 1 | PHC | 4 | 2007 | 5 | 1 | 1 | 43 | 2 |
| 1 | PHC | 4 | 2008 | 5 | 2 | 1 | 44 | 2 |
| 1 | PHC | 4 | 2009 | 5 | 2 | 3 | 43 | 4 |
| 1 | PHC | 4 | 2010 | 5 | 2 | 3 | 45 | 4 |
| 1 | PHC | 4 | 2011 | 5 | 2 | 3 | 44 | 4 |
| 2 | DH | 1 | 2007 | 300 | 21 | 83 | 30 | 18 |
| 2 | DH | 1 | 2008 | 300 | 32 | 86 | 27 | 13 |
| 2 | DH | 1 | 2009 | 300 | 29 | 82 | 26 | 21 |
| 2 | DH | 1 | 2010 | 300 | 28 | 83 | 24 | 14 |
| 2 | DH | 1 | 2011 | 300 | 30 | 78 | 24 | 17 |
| 2 | AH | 1 | 2007 | 100 | 8 | 14 | 17 | 6 |
| 2 | AH | 1 | 2008 | 100 | 17 | 29 | 19 | 6 |
| 2 | AH | 1 | 2009 | 100 | 15 | 27 | 16 | 6 |
| 2 | AH | 1 | 2010 | 100 | 16 | 35 | 14 | 6 |
| 2 | AH | 1 | 2011 | 100 | 15 | 36 | 14 | 6 |
| 2 | CHC | 1 | 2007 | 50 | 4 | 6 | 10 | 5 |
| 2 | CHC | 1 | 2008 | 50 | 3 | 6 | 10 | 5 |
| 2 | CHC | 1 | 2009 | 50 | 3 | 6 | 10 | 4 |
| 2 | CHC | 1 | 2010 | 50 | 3 | 6 | 9 | 5 |
| 2 | CHC | 1 | 2011 | 50 | 3 | 6 | 10 | 5 |
| 2 | PHC | 1 | 2007 | 0 | 1 | 1 | 5 | 1 |
| 2 | PHC | 1 | 2008 | 0 | 1 | 1 | 6 | 1 |
| 2 | PHC | 1 | 2009 | 0 | 1 | 1 | 4 | 1 |
| 2 | PHC | 1 | 2010 | 0 | 1 | 1 | 5 | 1 |
| 2 | PHC | 1 | 2011 | 0 | 1 | 1 | 5 | 1 |
| 2 | PHC | 2 | 2007 | 6 | 1 | 1 | 16 | 3 |
| 2 | PHC | 2 | 2008 | 6 | 1 | 1 | 15 | 3 |
| 2 | PHC | 2 | 2009 | 6 | 2 | 1 | 17 | 3 |
| 2 | PHC | 2 | 2010 | 6 | 1 | 1 | 17 | 3 |
| 2 | PHC | 2 | 2011 | 6 | 2 | 1 | 17 | 2 |
| 2 | CHC | 2 | 2007 | 40 | 6 | 7 | 10 | 7 |
| 2 | CHC | 2 | 2008 | 40 | 10 | 7 | 10 | 10 |
| 2 | CHC | 2 | 2009 | 40 | 12 | 7 | 10 | 8 |
| 2 | CHC | 2 | 2010 | 40 | 10 | 8 | 9 | 8 |



| OUTPUTS | | | | EXPENDITURE | | | | |
|---|---|---|---|---|---|---|---|---|
| Outpatient | Inpatient | Vaccinations | Births | Personnel | Infrastructure + Utilities | Medical supplies + pharmaceuticals | Administration and training | Non-medical |
| 42,106 | 524 | 35,619 | 88 | 1,732,356 | 89,735 | 237,474 | 17,914 | 136,455 |
| 43,974 | 427 | 1,146 | 77 | 2,610,380 | 102,948 | 254,132 | 25,104 | 311,461 |
| 49,447 | 511 | 46,752 | 23 | 3,754,712 | 45,978 | 155,687 | 2,000 | 193,490 |
| 45,122 | 519 | 35,740 | 56 | 4,337,530 | 88,984 | 218,672 | 7,852 | 302,412 |
| 32,517 | 733 | 20,056 | 45 | 5,988,213 | 53,362 | 367,260 | 10,945 | 231,102 |
| 56,509 | 2,327 | 6,476 | 82 | 1,053,020 | 42,647 | 295,117 | 85,611 | 0 |
| 56,134 | 1,200 | 6,896 | 101 | 1,660,100 | 41,304 | 316,268 | 81,448 | 98,099 |
| 80,671 | 2,267 | 6,797 | 112 | 1,951,258 | 40,697 | 234,679 | 74,350 | 77,625 |
| 83,630 | 2,407 | 6,334 | 99 | 2,971,698 | 41,107 | 239,954 | 57,978 | 178,916 |
| 86,142 | 2,734 | 6,561 | 72 | 3,915,490 | 40,547 | 400,195 | 176,468 | 98,075 |
| 257,387 | 31,554 | 5,634 | 2,368 | 37,001,436 | 1,933,149 | 6,360,362 | 74,774 | 176,154 |
| 219,709 | 33,392 | 6,804 | 2,431 | 48,083,316 | 1,316,264 | 5,836,233 | 54,664 | 550,550 |
| 222,785 | 33,872 | 5,477 | 2,390 | 46,685,196 | 3,630,014 | 6,300,638 | 60,000 | 1,705,374 |
| 230,765 | 32,797 | 5,845 | 2,380 | 58,272,516 | 1,382,670 | 6,596,454 | 25,000 | 1,282,695 |
| 232,910 | 31,331 | 6,395 | 2,503 | 65,346,228 | 2,702,821 | 13,879,202 | 59,166 | 2,185,004 |
| 230,324 | 11,089 | 132,824 | 1,717 | 7,182,566 | 230,601 | 1,925,000 | 55,145 | 0 |
| 219,463 | 11,608 | 134,508 | 1,619 | 18,048,626 | 211,076 | 1,940,000 | 24,828 | 0 |
| 269,739 | 12,740 | 134,882 | 1,835 | 37,493,680 | 257,023 | 2,314,198 | 48,975 | 0 |
| 204,651 | 13,015 | 112,791 | 1,701 | 29,469,684 | 265,050 | 3,084,560 | 69,302 | 0 |
| 223,539 | 13,927 | 128,061 | 2,506 | 36,105,452 | 311,098 | 7,138,705 | 115,765 | 0 |
| 122,334 | 7,432 | 68,066 | 415 | 4,179,094 | 380,239 | 789,000 | 67,159 | 146,922 |
| 104,717 | 8,337 | 51,164 | 455 | 5,126,924 | 391,506 | 828,000 | 74,164 | 345,679 |
| 135,086 | 9,653 | 66,658 | 519 | 6,114,623 | 273,593 | 1,178,554 | 75,969 | 418,986 |
| 129,927 | 8,462 | 62,736 | 423 | 7,684,884 | 1,030,877 | 1,880,284 | 91,146 | 444,578 |
| 99,811 | 7,686 | 53,365 | 394 | 9,150,620 | 997,093 | 3,527,169 | 93,569 | 472,040 |
| 32,568 | 606 | 25,636 | 298 | 1,457,416 | 17,418 | 332,296 | 1,074 | 0 |
| 33,216 | 780 | 26,463 | 329 | 1,641,844 | 17,779 | 356,452 | 1,362 | 0 |
| 36,236 | 1,097 | 28,399 | 273 | 1,949,900 | 34,178 | 134,734 | 3,486 | 0 |
| 33,617 | 1,664 | 26,027 | 224 | 3,053,314 | 26,194 | 326,440 | 3,300 | 0 |
| 30,956 | 1,067 | 24,514 | 364 | 3,798,048 | 98,215 | 577,992 | 58,470 | 0 |
| 72,234 | 1,220 | 62,108 | 50 | 2,717,842 | 129,650 | 332,296 | 600 | 2,000 |
| 61,869 | 1,341 | 50,587 | 57 | 3,965,798 | 132,171 | 356,452 | 700 | 2,100 |
| 70,221 | 1,372 | 53,508 | 54 | 5,695,892 | 131,287 | 464,756 | 750 | 2,200 |
| 81,306 | 1,828 | 64,979 | 60 | 7,419,416 | 124,495 | 766,580 | 0 | 248,207 |
| 76,741 | 1,553 | 63,828 | 58 | 7,857,094 | 133,311 | 1,154,362 | 0 | 356,310 |
| 70,636 | 2,781 | 49,446 | 204 | 3,879,576 | 145,013 | 429,000 | 13,682 | 11,391 |
| 75,370 | 2,985 | 52,608 | 257 | 4,753,012 | 208,776 | 495,000 | 18,291 | 15,888 |
| 85,811 | 3,822 | 64,868 | 249 | 5,762,432 | 167,057 | 627,616 | 23,000 | 25,000 |
| 87,902 | 3,694 | 66,838 | 225 | 7,277,580 | 318,361 | 1,007,156 | 24,891 | 81,342 |

| FACILITY INFORMATION | | | | INPUTS (BEDS & STAFF) | | | | |
|---|---|---|---|---|---|---|---|---|
| District | Platform | Facility | Year | Beds | Doctors | Nurses | Para-medical | Non-medical |
| 2 | CHC | 2 | 2011 | 40 | 12 | 8 | 9 | 8 |
| 2 | PHC | 3 | 2007 | 6 | 1 | 1 | 6 | 1 |
| 2 | PHC | 3 | 2008 | 6 | 1 | 1 | 6 | 1 |
| 2 | PHC | 3 | 2009 | 6 | 1 | 1 | 6 | 1 |
| 2 | PHC | 3 | 2010 | 6 | 1 | 1 | 5 | 1 |
| 2 | PHC | 3 | 2011 | 6 | 1 | 1 | 5 | 1 |
| 2 | PHC | 4 | 2007 | 4 | 3 | 1 | 5 | 0 |
| 2 | PHC | 4 | 2008 | 4 | 2 | 1 | 7 | 0 |
| 2 | PHC | 4 | 2009 | 4 | 2 | 1 | 8 | 0 |
| 2 | PHC | 4 | 2010 | 4 | 2 | 1 | 8 | 0 |
| 2 | PHC | 4 | 2011 | 4 | 3 | 1 | 7 | 0 |
| 3 | DH | 1 | 2007 | 250 | 36 | 103 | 51 | 41 |
| 3 | DH | 1 | 2008 | 250 | 35 | 97 | 56 | 43 |
| 3 | DH | 1 | 2009 | 250 | 34 | 88 | 58 | 49 |
| 3 | DH | 1 | 2010 | 250 | 36 | 105 | 58 | 46 |
| 3 | DH | 1 | 2011 | 250 | 49 | 108 | 59 | 48 |
| 3 | AH | 1 | 2007 | 100 | 14 | 28 | 15 | 11 |
| 3 | AH | 1 | 2008 | 100 | 14 | 29 | 15 | 11 |
| 3 | AH | 1 | 2009 | 100 | 14 | 29 | 18 | 11 |
| 3 | AH | 1 | 2010 | 100 | 15 | 30 | 19 | 11 |
| 3 | AH | 1 | 2011 | 100 | 15 | 30 | 19 | 11 |
| 3 | CHC | 1 | 2007 | 50 | 3 | 7 | 11 | 8 |
| 3 | CHC | 1 | 2008 | 50 | 7 | 10 | 10 | 7 |
| 3 | CHC | 1 | 2009 | 50 | 5 | 11 | 11 | 8 |
| 3 | CHC | 1 | 2010 | 50 | 6 | 11 | 11 | 8 |
| 3 | CHC | 1 | 2011 | 50 | 4 | 12 | 12 | 9 |
| 3 | PHC | 1 | 2007 | 5 | 1 | 1 | 12 | 2 |
| 3 | PHC | 1 | 2008 | 5 | 1 | 1 | 9 | 2 |
| 3 | PHC | 1 | 2009 | 5 | 1 | 1 | 9 | 2 |
| 3 | PHC | 1 | 2010 | 5 | 1 | 1 | 9 | 2 |
| 3 | PHC | 1 | 2011 | 5 | 1 | 1 | 10 | 2 |
| 3 | PHC | 2 | 2007 | 4 | 1 | 1 | 19 | 5 |
| 3 | PHC | 2 | 2008 | 4 | 1 | 1 | 17 | 5 |
| 3 | PHC | 2 | 2009 | 4 | 1 | 1 | 19 | 6 |
| 3 | PHC | 2 | 2010 | 4 | 1 | 1 | 18 | 5 |
| 3 | PHC | 2 | 2011 | 4 | 1 | 1 | 19 | 5 |
| 3 | CHC | 2 | 2007 | 50 | 8 | 11 | 10 | 11 |
| 3 | CHC | 2 | 2008 | 50 | 8 | 11 | 10 | 11 |
| 3 | CHC | 2 | 2009 | 50 | 8 | 11 | 10 | 10 |



| OUTPUTS | | | | EXPENDITURE | | | | |
|---|---|---|---|---|---|---|---|---|
| Outpatient | Inpatient | Vaccinations | Births | Personnel | Infrastructure + Utilities | Medical supplies + pharmaceuticals | Administration and training | Non-medical |
| 67,240 | 3,039 | 57,713 | 185 | 8,974,848 | 327,850 | 2,314,898 | 25,495 | 288,167 |
| 37,256 | 983 | 3,909 | 46 | 1,683,888 | 83,269 | 345,555 | 3,566 | 255 |
| 33,577 | 1,063 | 4,038 | 65 | 1,714,920 | 88,129 | 370,020 | 27,386 | 1 |
| 31,763 | 865 | 4,106 | 52 | 2,316,048 | 87,829 | 216,967 | 76,121 | 1 |
| 27,597 | 1,032 | 4,153 | 61 | 2,879,688 | 92,220 | 430,431 | 110,090 | 0 |
| 18,215 | 994 | 3,730 | 66 | 3,335,604 | 96,880 | 948,834 | 124,010 | 0 |
| 6,487 | 166 | 1,885 | 12 | 1,210,572 | 157,050 | 58,103 | 13,316 | 0 |
| 6,612 | 169 | 1,610 | 12 | 1,957,896 | 156,625 | 61,268 | 23,996 | 0 |
| 8,094 | 330 | 1,596 | 12 | 3,305,448 | 160,238 | 95,602 | 2,368 | 0 |
| 7,797 | 380 | 1,639 | 15 | 3,534,516 | 156,321 | 172,503 | 2,845 | 0 |
| 10,355 | 603 | 1,606 | 12 | 3,930,108 | 154,936 | 372,771 | 3,520 | 58,820 |
| 34,888 | 19,446 | 2,641 | 1,786 | 45,713,992 | 8,732,327 | 4,820,512 | 483,001 | 1,479,163 |
| 66,566 | 18,003 | 2,686 | 1,868 | 50,237,096 | 9,065,897 | 4,858,194 | 1,004,021 | 1,344,387 |
| 66,190 | 17,670 | 2,639 | 1,755 | 55,345,384 | 8,225,704 | 4,465,486 | 1,758,403 | 2,649,289 |
| 91,680 | 21,703 | 2,296 | 2,588 | 67,580,856 | 8,892,572 | 3,787,082 | 1,094,640 | 3,922,772 |
| 106,781 | 21,865 | 2,290 | 2,904 | 73,741,400 | 9,172,054 | 6,766,970 | 852,074 | 6,541,858 |
| 74,809 | 4,900 | 2,493 | 885 | 15,478,292 | 1,008,589 | 1,444,909 | 42,522 | 262,590 |
| 73,127 | 4,495 | 4,034 | 702 | 15,784,310 | 1,287,233 | 1,952,389 | 22,479 | 265,100 |
| 69,387 | 4,361 | 3,853 | 503 | 16,987,894 | 1,540,722 | 1,152,646 | 33,898 | 283,000 |
| 75,950 | 5,338 | 3,449 | 367 | 17,557,652 | 1,659,052 | 1,300,921 | 22,371 | 397,960 |
| 69,653 | 4,875 | 3,617 | 516 | 21,485,638 | 2,017,294 | 2,292,742 | 28,562 | 535,790 |
| 42,376 | 1,126 | 734 | 139 | 3,342,192 | 307,226 | 630,807 | 27,333 | 23,330 |
| 39,748 | 1,006 | 478 | 263 | 6,607,524 | 410,784 | 825,526 | 29,565 | 145,270 |
| 50,866 | 1,956 | 898 | 399 | 6,988,032 | 368,618 | 708,541 | 29,186 | 343,480 |
| 57,057 | 2,167 | 1,426 | 444 | 8,196,432 | 325,643 | 658,729 | 16,772 | 333,200 |
| 44,102 | 2,187 | 1,940 | 447 | 12,194,124 | 442,125 | 1,121,380 | 81,868 | 232,470 |
| 15,720 | 206 | 539 | 34 | 2,642,643 | 155,341 | 217,529 | 12,400 | 0 |
| 16,668 | 284 | 434 | 26 | 2,830,223 | 79,516 | 232,919 | 94,600 | 0 |
| 19,082 | 209 | 414 | 41 | 2,894,293 | 56,240 | 201,285 | 280,727 | 0 |
| 21,848 | 287 | 402 | 40 | 3,818,567 | 54,803 | 363,172 | 249,096 | 0 |
| 26,295 | 237 | 390 | 17 | 4,519,341 | 49,941 | 485,960 | 410,536 | 0 |
| 36,249 | 116 | 556 | 37 | 4,786,178 | 70,020 | 432,064 | 8,744 | 0 |
| 43,863 | 110 | 574 | 27 | 6,719,201 | 67,090 | 489,472 | 32,877 | 44,400 |
| 34,350 | 151 | 617 | 39 | 7,748,056 | 50,415 | 321,600 | 4,412 | 0 |
| 50,762 | 494 | 504 | 32 | 9,106,558 | 38,420 | 562,136 | 5,264 | 80,000 |
| 32,852 | 754 | 598 | 29 | 11,163,012 | 92,892 | 850,986 | 14,331 | 81,550 |
| 107,056 | 2,958 | 34,597 | 638 | 4,896,102 | 1,134,202 | 787,500 | 300,879 | 383,570 |
| 112,392 | 4,029 | 33,557 | 647 | 5,554,191 | 1,109,175 | 825,000 | 55,942 | 354,878 |
| 109,917 | 4,399 | 35,545 | 420 | 6,134,570 | 1,014,666 | 877,408 | 131,217 | 412,000 |

| FACILITY INFORMATION | | | | INPUTS (BEDS & STAFF) | | | | |
|---|---|---|---|---|---|---|---|---|
| District | Platform | Facility | Year | Beds | Doctors | Nurses | Para-medical | Non-medical |
| 3 | CHC | 2 | 2010 | 50 | 8 | 11 | 10 | 10 |
| 3 | CHC | 2 | 2011 | 50 | 7 | 11 | 10 | 10 |
| 3 | PHC | 3 | 2007 | 0 | 0 | 0 | 1 | 0 |
| 3 | PHC | 3 | 2008 | 0 | 0 | 0 | 0 | 0 |
| 3 | PHC | 3 | 2009 | 0 | 0 | 0 | 0 | 0 |
| 3 | PHC | 3 | 2010 | 0 | 0 | 0 | 0 | 0 |
| 3 | PHC | 3 | 2011 | 0 | 1 | 1 | 3 | 1 |
| 3 | PHC | 4 | 2007 | 5 | 1 | 2 | 16 | 2 |
| 3 | PHC | 4 | 2008 | 5 | 2 | 2 | 15 | 2 |
| 3 | PHC | 4 | 2009 | 5 | 1 | 2 | 19 | 0 |
| 3 | PHC | 4 | 2010 | 5 | 1 | 2 | 21 | 2 |
| 3 | PHC | 4 | 2011 | 5 | 1 | 2 | 13 | 2 |
| 4 | DH | 1 | 2007 | 200 | 1 | 9 | 0 | 0 |
| 4 | DH | 1 | 2008 | 200 | 1 | 10 | 0 | 0 |
| 4 | DH | 1 | 2009 | 200 | 1 | 10 | 0 | 0 |
| 4 | DH | 1 | 2010 | 200 | 1 | 9 | 0 | 0 |
| 4 | DH | 1 | 2011 | 200 | 1 | 11 | 0 | 0 |
| 4 | AH | 1 | 2007 | 120 | 9 | 21 | 16 | 8 |
| 4 | AH | 1 | 2008 | 120 | 9 | 19 | 15 | 7 |
| 4 | AH | 1 | 2009 | 120 | 11 | 20 | 10 | 8 |
| 4 | AH | 1 | 2010 | 120 | 12 | 23 | 13 | 9 |
| 4 | AH | 1 | 2011 | 120 | 11 | 19 | 11 | 10 |
| 4 | CHC | 1 | 2007 | 30 | 5 | 3 | 7 | 6 |
| 4 | CHC | 1 | 2008 | 30 | 5 | 5 | 6 | 4 |
| 4 | CHC | 1 | 2009 | 30 | 5 | 5 | 6 | 5 |
| 4 | CHC | 1 | 2010 | 30 | 5 | 6 | 7 | 5 |
| 4 | CHC | 1 | 2011 | 30 | 6 | 6 | 7 | 4 |
| 4 | PHC | 1 | 2007 | 6 | 2 | 2 | 9 | 3 |
| 4 | PHC | 1 | 2008 | 6 | 3 | 2 | 9 | 3 |
| 4 | PHC | 1 | 2009 | 6 | 2 | 2 | 9 | 3 |
| 4 | PHC | 1 | 2010 | 6 | 2 | 2 | 9 | 3 |
| 4 | PHC | 1 | 2011 | 6 | 2 | 2 | 9 | 3 |
| 4 | PHC | 2 | 2007 | 6 | 3 | 0 | 16 | 1 |
| 4 | PHC | 2 | 2008 | 6 | 3 | 1 | 17 | 1 |
| 4 | PHC | 2 | 2009 | 6 | 3 | 1 | 17 | 0 |
| 4 | PHC | 2 | 2010 | 6 | 2 | 1 | 16 | 2 |
| 4 | PHC | 2 | 2011 | 6 | 4 | 1 | 16 | 3 |
| 4 | SHC | 2 | 2007 | 0 | 0 | 0 | 2 | 0 |
| 4 | CHC | 2 | 2007 | 60 | 7 | 6 | 9 | 6 |



| OUTPUTS | | | | EXPENDITURE | | | | |
|---|---|---|---|---|---|---|---|---|
| Outpatient | Inpatient | Vaccinations | Births | Personnel | Infrastructure + Utilities | Medical supplies + pharmaceuticals | Administration and training | Non-medical |
| 76,587 | 4,687 | 34,746 | 329 | 6,737,220 | 932,455 | 1,129,660 | 57,941 | 297,665 |
| 62,578 | 3,828 | 29,847 | 92 | 7,472,722 | 970,042 | 1,621,548 | 74,217 | 255,433 |
| 1,942 | 0 | 0 | 0 | 52,459 | 25,541 | 86,412 | 398 | 12 |
| 2,179 | 0 | 0 | 0 | 72,018 | 25,205 | 92,696 | 200 | 6 |
| 3,705 | 0 | 0 | 0 | 492,838 | 80,226 | 88,668 | 1,430 | 359 |
| 3,994 | 0 | 0 | 0 | 749,472 | 70,011 | 104,660 | 1,903 | 822 |
| 5,893 | 0 | 5,893 | 0 | 1,319,392 | 218,559 | 239,500 | 7,300 | 6,000 |
| 10,247 | 347 | 6,852 | 36 | 3,091,589 | 44,223 | 270,040 | 1,160 | 0 |
| 8,497 | 641 | 5,685 | 54 | 3,736,270 | 50,663 | 289,672 | 39,122 | 0 |
| 16,284 | 372 | 8,367 | 26 | 4,538,456 | 61,723 | 193,968 | 5,739 | 69 |
| 19,171 | 593 | 8,583 | 24 | 6,447,956 | 55,223 | 353,968 | 1,130 | 0 |
| 14,957 | 395 | 6,080 | 34 | 5,063,031 | 134,223 | 595,744 | 65,675 | 180,274 |
| 192,345 | 11,397 | 14,680 | 1,843 | 0 | 138,425 | 3,891,190 | 0 | 0 |
| 179,421 | 13,176 | 16,095 | 1,997 | 0 | 153,072 | 3,925,048 | 0 | 0 |
| 254,144 | 13,941 | 16,050 | 2,011 | 0 | 270,700 | 3,592,434 | 0 | 0 |
| 267,007 | 15,854 | 15,998 | 2,265 | 0 | 211,605 | 3,981,430 | 0 | 0 |
| 199,399 | 13,414 | 16,221 | 2,238 | 0 | 275,233 | 6,201,551 | 0 | 0 |
| 145,190 | 20,254 | 5,315 | 1,491 | 9,925,416 | 1,166,441 | 2,137,500 | 52,896 | 905,139 |
| 128,685 | 9,208 | 5,398 | 1,879 | 11,139,396 | 972,840 | 1,940,000 | 80,390 | 742,420 |
| 150,299 | 7,485 | 5,340 | 1,856 | 12,438,420 | 475,672 | 2,180,142 | 24,000 | 373,320 |
| 148,475 | 8,911 | 9,630 | 1,461 | 18,221,328 | 862,008 | 2,504,491 | 20,000 | 418,000 |
| 152,350 | 9,645 | 10,083 | 1,899 | 16,578,892 | 1,030,496 | 3,166,701 | 36,000 | 556,540 |
| 88,900 | 2,260 | 3,981 | 304 | 3,799,238 | 167,830 | 411,138 | 11,026 | 10,112 |
| 51,249 | 3,218 | 3,602 | 257 | 4,513,544 | 360,049 | 508,838 | 24,108 | 11,540 |
| 64,409 | 2,859 | 3,727 | 247 | 5,053,667 | 396,445 | 589,693 | 20,087 | 74,860 |
| 59,954 | 3,542 | 3,332 | 248 | 14,196,109 | 207,502 | 768,997 | 27,148 | 97,160 |
| 57,262 | 2,392 | 4,218 | 260 | 8,014,930 | 260,019 | 1,293,666 | 29,647 | 168,280 |
| 10,976 | 157 | 10,986 | 38 | 1,522,405 | 72,402 | 340,436 | 2,111 | 446,850 |
| 9,014 | 131 | 8,994 | 32 | 2,280,125 | 88,899 | 379,876 | 10,172 | 559,800 |
| 9,322 | 180 | 9,255 | 47 | 2,312,268 | 86,643 | 248,943 | 17,820 | 324,135 |
| 9,398 | 177 | 9,388 | 51 | 3,355,516 | 87,492 | 302,844 | 78,460 | 151,400 |
| 9,757 | 81 | 23 | 6 | 4,398,843 | 100,934 | 499,714 | 31,545 | 156,798 |
| 8,524 | 675 | 7,031 | 142 | 2,982,016 | 45,774 | 365,827 | 26,997 | 1,451,432 |
| 10,208 | 685 | 7,673 | 165 | 3,922,788 | 46,983 | 392,218 | 35,842 | 1,536,169 |
| 11,993 | 686 | 7,823 | 181 | 4,313,808 | 43,849 | 356,929 | 8,867 | 1,260,864 |
| 12,142 | 689 | 7,754 | 217 | 4,957,868 | 48,583 | 543,872 | 140,565 | 859,041 |
| 19,389 | 661 | 8,567 | 93 | 7,351,836 | 45,852 | 511,338 | 108,688 | 1,339,973 |
| 959 | 0 | 1,131 | 0 | 132,000 | 3,293 | 4,700 | 7,000 | 3,923 |
| 8,006 | 4,188 | 45,973 | 311 | 3,638,828 | 1,603,423 | 185,054 | 131,172 | 1,118,977 |

| FACILITY INFORMATION | | | | INPUTS (BEDS & STAFF) | | | | |
|---|---|---|---|---|---|---|---|---|
| District | Platform | Facility | Year | Beds | Doctors | Nurses | Para-medical | Non-medical |
| 4 | CHC | 2 | 2008 | 60 | 6 | 6 | 11 | 5 |
| 4 | CHC | 2 | 2009 | 60 | 6 | 6 | 10 | 5 |
| 4 | CHC | 2 | 2010 | 60 | 5 | 5 | 10 | 5 |
| 4 | CHC | 2 | 2011 | 60 | 6 | 4 | 8 | 5 |
| 4 | PHC | 3 | 2007 | 5 | 0 | 2 | 14 | 4 |
| 4 | PHC | 3 | 2008 | 5 | 2 | 2 | 12 | 4 |
| 4 | PHC | 3 | 2009 | 5 | 2 | 2 | 11 | 4 |
| 4 | PHC | 3 | 2010 | 5 | 2 | 2 | 9 | 4 |
| 4 | PHC | 3 | 2011 | 5 | 2 | 2 | 9 | 4 |
| 4 | PHC | 4 | 2007 | 0 | 2 | 1 | 26 | 0 |
| 4 | PHC | 4 | 2008 | 0 | 2 | 1 | 26 | 0 |
| 4 | PHC | 4 | 2009 | 0 | 1 | 1 | 27 | 0 |
| 4 | PHC | 4 | 2010 | 0 | 1 | 1 | 29 | 0 |
| 4 | PHC | 4 | 2011 | 0 | 2 | 1 | 27 | 2 |
| 5 | DH | 1 | 2007 | 200 | 27 | 61 | 19 | 86 |
| 5 | DH | 1 | 2008 | 200 | 28 | 61 | 19 | 83 |
| 5 | DH | 1 | 2009 | 200 | 31 | 61 | 19 | 80 |
| 5 | DH | 1 | 2010 | 200 | 32 | 61 | 20 | 78 |
| 5 | DH | 1 | 2011 | 200 | 30 | 62 | 21 | 77 |
| 5 | AH | 1 | 2007 | 100 | 14 | 29 | 31 | 20 |
| 5 | AH | 1 | 2008 | 100 | 20 | 29 | 29 | 18 |
| 5 | AH | 1 | 2009 | 100 | 21 | 27 | 32 | 19 |
| 5 | AH | 1 | 2010 | 100 | 20 | 29 | 23 | 18 |
| 5 | AH | 1 | 2011 | 100 | 21 | 29 | 24 | 17 |
| 5 | AH | 2 | 2007 | 100 | 19 | 27 | 16 | 30 |
| 5 | AH | 2 | 2008 | 100 | 17 | 27 | 17 | 29 |
| 5 | AH | 2 | 2009 | 100 | 19 | 27 | 18 | 28 |
| 5 | AH | 2 | 2010 | 100 | 17 | 28 | 20 | 28 |
| 5 | AH | 2 | 2011 | 100 | 21 | 29 | 17 | 29 |
| 6 | DH | 1 | 2007 | 350 | 17 | 84 | 21 | 84 |
| 6 | DH | 1 | 2008 | 350 | 18 | 85 | 17 | 87 |
| 6 | DH | 1 | 2009 | 350 | 19 | 85 | 19 | 87 |
| 6 | DH | 1 | 2010 | 350 | 22 | 88 | 21 | 87 |
| 6 | DH | 1 | 2011 | 350 | 22 | 88 | 21 | 87 |
| 6 | AH | 1 | 2007 | 100 | 7 | 18 | 10 | 17 |
| 6 | AH | 1 | 2008 | 100 | 6 | 19 | 7 | 14 |
| 6 | AH | 1 | 2009 | 100 | 6 | 18 | 7 | 16 |
| 6 | AH | 1 | 2010 | 100 | 7 | 10 | 7 | 17 |
| 6 | AH | 1 | 2011 | 100 | 7 | 22 | 7 | 16 |



| OUTPUTS | | | | EXPENDITURE | | | | |
|---|---|---|---|---|---|---|---|---|
| Outpatient | Inpatient | Vaccinations | Births | Personnel | Infrastructure + Utilities | Medical supplies + pharmaceuticals | Administration and training | Non-medical |
| 6,879 | 3,027 | 43,785 | 391 | 4,110,646 | 1,601,893 | 200,245 | 101,356 | 985,022 |
| 6,081 | 6,725 | 41,287 | 448 | 5,502,108 | 1,670,159 | 206,190 | 120,237 | 1,868,283 |
| 7,372 | 7,905 | 53,233 | 616 | 6,637,629 | 1,745,861 | 196,296 | 137,740 | 1,880,787 |
| 6,725 | 7,943 | 41,507 | 480 | 8,030,168 | 1,840,732 | 307,952 | 144,817 | 1,166,609 |
| 13,120 | 264 | 0 | 155 | 3,388,188 | 52,593 | 345,628 | 26,934 | 0 |
| 9,207 | 386 | 0 | 201 | 3,588,300 | 239,809 | 387,756 | 75,110 | 0 |
| 26,788 | 395 | 0 | 270 | 4,010,016 | 98,521 | 356,743 | 6,336 | 0 |
| 32,583 | 375 | 0 | 226 | 4,200,804 | 68,541 | 155,152 | 2,033 | 0 |
| 42,007 | 300 | 32,019 | 118 | 4,444,440 | 232,313 | 270,952 | 5,963 | 0 |
| 7,631 | 0 | 7,631 | 0 | 812,954 | 13,662 | 192,780 | 4,000 | 35,800 |
| 10,637 | 0 | 6,326 | 0 | 1,116,066 | 15,377 | 208,536 | 4,200 | 42,200 |
| 7,993 | 0 | 7,993 | 0 | 1,251,808 | 14,931 | 223,065 | 5,000 | 54,800 |
| 8,266 | 0 | 8,246 | 0 | 1,966,469 | 14,664 | 167,060 | 6,200 | 77,900 |
| 8,409 | 0 | 8,409 | 0 | 2,747,737 | 16,008 | 277,118 | 7,797 | 87,900 |
| 226,898 | 6,048 | 7,027 | 1,783 | 30,848,236 | 5,354,116 | 2,876,000 | 266,911 | 768,545 |
| 225,782 | 7,158 | 7,489 | 1,916 | 56,666,076 | 4,234,347 | 3,880,000 | 200,142 | 1,293,960 |
| 255,306 | 9,603 | 8,252 | 2,991 | 63,210,652 | 6,575,814 | 4,310,748 | 270,533 | 1,252,265 |
| 205,233 | 11,043 | 7,917 | 2,642 | 100,136,480 | 4,693,520 | 3,153,399 | 211,088 | 814,525 |
| 274,987 | 9,654 | 8,280 | 2,230 | 108,605,440 | 10,972,123 | 4,402,604 | 404,445 | 1,449,208 |
| 191,167 | 5,830 | 114,279 | 1,137 | 21,839,340 | 999,924 | 1,610,000 | 49,647 | 535,310 |
| 257,033 | 5,705 | 139,492 | 1,450 | 25,813,668 | 1,105,615 | 1,952,500 | 104,674 | 603,269 |
| 328,518 | 6,435 | 172,726 | 1,280 | 26,894,688 | 2,384,863 | 3,752,818 | 31,160 | 719,684 |
| 276,517 | 8,342 | 160,131 | 1,352 | 32,476,392 | 2,279,508 | 2,585,719 | 11,325 | 616,397 |
| 276,131 | 8,508 | 150,372 | 1,639 | 38,365,524 | 3,479,179 | 3,772,796 | 22,899 | 637,810 |
| 149,364 | 2,838 | 103,210 | 803 | 18,632,976 | 491,466 | 1,631,555 | 30,049 | 522,578 |
| 142,573 | 3,761 | 81,720 | 806 | 24,727,876 | 524,577 | 1,976,238 | 37,532 | 488,148 |
| 175,892 | 6,631 | 29,554 | 1,086 | 28,870,896 | 523,544 | 4,823,163 | 37,124 | 584,259 |
| 159,575 | 8,789 | 108,962 | 1,138 | 34,106,892 | 730,446 | 1,977,585 | 27,258 | 864,095 |
| 142,912 | 8,222 | 86,423 | 1,397 | 42,667,320 | 875,925 | 3,353,210 | 38,027 | 854,929 |
| 183,702 | 27,095 | 12,214 | 1,349 | 38,762,016 | 76,150,702 | 6,022,937 | 0 | 1,632,462 |
| 162,387 | 27,816 | 11,640 | 1,281 | 48,214,512 | 77,592,064 | 6,825,097 | 0 | 2,358,320 |
| 279,117 | 33,531 | 12,746 | 1,273 | 55,776,348 | 80,480,728 | 8,549,006 | 0 | 2,392,550 |
| 238,747 | 35,146 | 13,257 | 1,243 | 78,754,016 | 96,433,712 | 7,318,353 | 0 | 1,499,078 |
| 256,899 | 32,866 | 15,593 | 1,584 | 81,724,016 | 90,723,152 | 11,340,938 | 0 | 5,498,090 |
| 136,441 | 7,874 | 1,724 | 234 | 5,842,964 | 370,621 | 1,716,334 | 11,633 | 445,765 |
| 124,292 | 7,826 | 1,829 | 331 | 6,405,422 | 836,760 | 1,946,084 | 88,882 | 1,377,660 |
| 106,859 | 10,004 | 2,130 | 364 | 8,970,604 | 458,442 | 1,572,224 | 199,810 | 624,983 |
| 99,553 | 8,367 | 1,902 | 419 | 8,143,324 | 428,572 | 2,009,868 | 126,084 | 493,052 |
| 103,829 | 8,869 | 2,168 | 504 | 9,120,629 | 616,734 | 2,920,678 | 149,813 | 347,600 |

| FACILITY INFORMATION | | | | INPUTS (BEDS & STAFF) | | | | | OUTPUTS | | | | EXPENDITURE | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| District | Platform | Facility | Year | Beds | Doctors | Nurses | Para-medical | Non-medical | Outpatient | Inpatient | Vaccinations | Births | Personnel | Infrastructure + Utilities | Medical supplies + pharmaceuticals | Administration and training | Non-medical |
| 6 | CHC | 1 | 2007 | 13 | 3 | 5 | 11 | 1 | 14,790 | 380 | 13,557 | 16 | 3,359,420 | 115,240 | 337,545 | 847,922 | 365,300 |
| 6 | CHC | 1 | 2008 | 13 | 4 | 1 | 13 | 1 | 15,605 | 422 | 14,152 | 33 | 3,604,719 | 111,773 | 361,656 | 329,402 | 225,450 |
| 6 | CHC | 1 | 2009 | 13 | 3 | 3 | 12 | 1 | 18,879 | 446 | 15,067 | 20 | 4,147,740 | 126,320 | 408,576 | 485,610 | 186,800 |
| 6 | CHC | 1 | 2010 | 13 | 3 | 2 | 12 | 1 | 24,819 | 520 | 19,782 | 16 | 5,466,748 | 135,844 | 353,334 | 695,174 | 101,730 |
| 6 | CHC | 1 | 2011 | 13 | 4 | 7 | 12 | 2 | 22,713 | 566 | 19,092 | 38 | 8,267,327 | 150,699 | 644,886 | 535,643 | 396,487 |
| 6 | PHC | 1 | 2007 | 5 | 2 | 0 | 14 | 2 | 11,635 | 140 | 11,495 | 26 | 2,874,968 | 49,755 | 261,363 | 149,250 | 236,518 |
| 6 | PHC | 1 | 2008 | 5 | 2 | 0 | 16 | 2 | 11,125 | 183 | 1,054 | 12 | 3,707,687 | 47,557 | 262,101 | 45,000 | 580,240 |
| 6 | PHC | 1 | 2009 | 5 | 2 | 0 | 18 | 2 | 14,289 | 207 | 13,950 | 36 | 5,186,213 | 40,067 | 198,885 | 192,390 | 359,503 |
| 6 | PHC | 1 | 2010 | 5 | 2 | 1 | 15 | 2 | 10,758 | 201 | 1,276 | 14 | 6,228,060 | 38,288 | 289,347 | 353,738 | 218,213 |
| 6 | PHC | 1 | 2011 | 5 | 1 | 1 | 13 | 1 | 11,778 | 287 | 1,438 | 25 | 5,702,800 | 39,962 | 475,125 | 374,562 | 265,558 |
| 6 | PHC | 2 | 2007 | 6 | 1 | 1 | 14 | 4 | 18,699 | 567 | 11,235 | 51 | 2,497,916 | 98,158 | 363,624 | 42,356 | 0 |
| 6 | PHC | 2 | 2008 | 6 | 1 | 1 | 14 | 4 | 29,129 | 435 | 10,693 | 61 | 2,867,172 | 285,374 | 385,302 | 56,456 | 0 |
| 6 | PHC | 2 | 2009 | 6 | 1 | 1 | 14 | 4 | 8,191 | 205 | 12,609 | 15 | 3,121,214 | 144,086 | 313,100 | 87,690 | 0 |
| 6 | PHC | 2 | 2010 | 6 | 1 | 1 | 17 | 4 | 6,559 | 208 | 12,410 | 14 | 3,563,040 | 114,106 | 357,791 | 96,756 | 0 |
| 6 | PHC | 2 | 2011 | 6 | 1 | 1 | 17 | 4 | 22,710 | 241 | 10,185 | 9 | 4,125,994 | 277,878 | 509,186 | 110,000 | 0 |
| 6 | CHC | 2 | 2007 | 8 | 5 | 4 | 12 | 7 | 22,905 | 1,029 | 12,240 | 62 | 8,335,564 | 103,321 | 366,906 | 32,474 | 1,208,571 |
| 6 | CHC | 2 | 2008 | 8 | 4 | 4 | 13 | 7 | 29,108 | 556 | 12,812 | 58 | 8,770,403 | 111,123 | 392,091 | 35,400 | 1,251,040 |
| 6 | CHC | 2 | 2009 | 8 | 4 | 3 | 14 | 7 | 25,819 | 552 | 13,643 | 76 | 8,884,964 | 118,029 | 383,719 | 52,800 | 1,138,331 |
| 6 | CHC | 2 | 2010 | 8 | 5 | 5 | 14 | 7 | 22,662 | 474 | 14,220 | 67 | 12,186,084 | 121,563 | 521,017 | 105,865 | 1,321,000 |
| 6 | CHC | 2 | 2011 | 8 | 5 | 5 | 16 | 7 | 20,671 | 496 | 16,016 | 60 | 13,843,136 | 122,420 | 925,121 | 167,000 | 1,151,618 |
| 6 | PHC | 3 | 2007 | 6 | 2 | 1 | 8 | 2 | 12,947 | 31 | 8,907 | 0 | 2,982,802 | 146,248 | 221,532 | 5,200 | 26,173 |
| 6 | PHC | 3 | 2008 | 6 | 2 | 1 | 7 | 2 | 14,037 | 113 | 8,758 | 2 | 3,058,476 | 177,086 | 237,636 | 7,860 | 108,400 |
| 6 | PHC | 3 | 2009 | 6 | 2 | 1 | 8 | 2 | 13,920 | 198 | 341 | 2 | 3,132,607 | 190,960 | 100,509 | 7,570 | 45,600 |
| 6 | PHC | 3 | 2010 | 6 | 2 | 1 | 7 | 2 | 13,964 | 207 | 355 | 3 | 3,315,613 | 144,384 | 129,261 | 7,871 | 47,000 |
| 6 | PHC | 3 | 2011 | 6 | 2 | 1 | 5 | 2 | 12,548 | 102 | 340 | 0 | 2,969,701 | 212,133 | 272,750 | 13,760 | 39,000 |
| 6 | PHC | 4 | 2007 | 4 | 1 | 1 | 8 | 1 | 6,672 | 69 | 11,636 | 26 | 1,688,484 | 22,758 | 224,132 | 7,000 | 179,435 |
| 6 | PHC | 4 | 2008 | 4 | 1 | 1 | 8 | 1 | 8,014 | 77 | 997 | 15 | 1,798,824 | 22,958 | 240,582 | 7,200 | 181,642 |
| 6 | PHC | 4 | 2009 | 4 | 1 | 1 | 8 | 1 | 8,785 | 68 | 1,160 | 16 | 2,322,696 | 23,847 | 78,823 | 7,598 | 197,910 |
| 6 | PHC | 4 | 2010 | 4 | 1 | 1 | 8 | 1 | 10,337 | 81 | 730 | 14 | 2,450,388 | 24,858 | 97,749 | 7,700 | 204,009 |
| 6 | PHC | 4 | 2011 | 4 | 1 | 1 | 8 | 1 | 10,827 | 78 | 711 | 14 | 2,878,644 | 24,958 | 251,972 | 8,000 | 200,353 |
| 7 | DH | 1 | 2007 | 250 | 14 | 63 | 49 | 34 | 71,244 | 14,765 | 8,533 | 1,741 | 34,671,876 | 1,102,299 | 4,303,454 | 62,004 | 7,127,574 |
| 7 | DH | 1 | 2008 | 250 | 16 | 76 | 47 | 25 | 147,569 | 34,777 | 10,518 | 4,299 | 28,972,788 | 1,082,462 | 4,886,047 | 70,903 | 7,467,433 |
| 7 | DH | 1 | 2009 | 250 | 17 | 32 | 49 | 26 | 144,220 | 60,826 | 12,260 | 3,842 | 29,432,568 | 1,128,066 | 6,565,477 | 69,759 | 8,692,687 |
| 7 | DH | 1 | 2010 | 250 | 15 | 32 | 34 | 23 | 154,864 | 64,662 | 13,375 | 4,090 | 26,665,296 | 1,085,555 | 7,194,943 | 126,250 | 7,996,570 |
| 7 | DH | 1 | 2011 | 250 | 20 | 69 | 51 | 30 | 156,790 | 64,210 | 15,021 | 4,453 | 59,796,996 | 1,222,712 | 10,484,306 | 97,684 | 8,453,027 |
| 7 | AH | 1 | 2007 | 100 | 10 | 22 | 20 | 8 | 103,925 | 8,082 | 53,850 | 1,187 | 11,326,531 | 598,120 | 1,562,440 | 47,837 | 184,602 |
| 7 | AH | 1 | 2008 | 100 | 9 | 24 | 19 | 9 | 112,634 | 9,166 | 63,047 | 1,266 | 14,889,897 | 754,414 | 1,964,206 | 82,980 | 135,114 |
| 7 | AH | 1 | 2009 | 100 | 10 | 25 | 21 | 9 | 125,450 | 8,459 | 72,676 | 758 | 17,300,006 | 1,290,014 | 1,515,308 | 96,822 | 246,206 |
| 7 | AH | 1 | 2010 | 100 | 11 | 26 | 20 | 10 | 129,224 | 10,818 | 75,255 | 773 | 20,346,112 | 806,939 | 2,501,857 | 41,628 | 104,338 |

| FACILITY INFORMATION | | | | INPUTS (BEDS & STAFF) | | | | |
|---|---|---|---|---|---|---|---|---|
| District | Platform | Facility | Year | Beds | Doctors | Nurses | Para-medical | Non-medical |
| 7 | AH | 1 | 2011 | 100 | 11 | 26 | 21 | 10 |
| 7 | CHC | 1 | 2007 | 50 | 6 | 10 | 13 | 5 |
| 7 | CHC | 1 | 2008 | 50 | 9 | 10 | 11 | 5 |
| 7 | CHC | 1 | 2009 | 50 | 8 | 11 | 13 | 4 |
| 7 | CHC | 1 | 2010 | 50 | 9 | 11 | 16 | 6 |
| 7 | CHC | 1 | 2011 | 50 | 7 | 10 | 13 | 6 |
| 7 | PHC | 1 | 2007 | 10 | 2 | 1 | 17 | 5 |
| 7 | PHC | 1 | 2008 | 10 | 1 | 1 | 18 | 4 |
| 7 | PHC | 1 | 2009 | 10 | 0 | 1 | 17 | 4 |
| 7 | PHC | 1 | 2010 | 10 | 1 | 2 | 17 | 3 |
| 7 | PHC | 1 | 2011 | 10 | 1 | 2 | 16 | 3 |
| 7 | PHC | 2 | 2007 | 4 | 2 | 3 | 6 | 5 |
| 7 | PHC | 2 | 2008 | 4 | 2 | 3 | 6 | 5 |
| 7 | PHC | 2 | 2009 | 4 | 2 | 3 | 6 | 5 |
| 7 | PHC | 2 | 2010 | 4 | 2 | 3 | 6 | 5 |
| 7 | PHC | 2 | 2011 | 4 | 2 | 3 | 5 | 4 |
| 7 | SHC | 2 | 2011 | 0 | 0 | 0 | 2 | 0 |
| 7 | CHC | 2 | 2007 | 50 | 3 | 6 | 2 | 3 |
| 7 | CHC | 2 | 2008 | 50 | 7 | 13 | 3 | 2 |
| 7 | CHC | 2 | 2009 | 50 | 5 | 11 | 2 | 3 |
| 7 | CHC | 2 | 2010 | 50 | 6 | 10 | 6 | 3 |
| 7 | CHC | 2 | 2011 | 50 | 5 | 13 | 6 | 4 |
| 7 | PHC | 3 | 2007 | 8 | 2 | 2 | 7 | 4 |
| 7 | PHC | 3 | 2008 | 8 | 2 | 2 | 7 | 4 |
| 7 | PHC | 3 | 2009 | 8 | 2 | 2 | 7 | 4 |
| 7 | PHC | 3 | 2010 | 8 | 2 | 3 | 7 | 4 |
| 7 | PHC | 3 | 2011 | 8 | 2 | 3 | 7 | 4 |
| 7 | PHC | 4 | 2007 | 4 | 1 | 2 | 7 | 2 |
| 7 | PHC | 4 | 2008 | 4 | 1 | 2 | 7 | 2 |
| 7 | PHC | 4 | 2009 | 4 | 1 | 1 | 6 | 2 |
| 7 | PHC | 4 | 2010 | 4 | 1 | 0 | 6 | 1 |
| 7 | PHC | 4 | 2011 | 4 | 1 | 2 | 5 | 1 |
| 8 | DH | 1 | 2007 | 500 | 0 | 0 | 30 | 0 |
| 8 | DH | 1 | 2008 | 500 | 23 | 47 | 50 | 37 |
| 8 | DH | 1 | 2009 | 500 | 6 | 81 | 37 | 40 |
| 8 | DH | 1 | 2010 | 500 | 6 | 81 | 38 | 32 |
| 8 | DH | 1 | 2011 | 500 | 6 | 85 | 38 | 32 |
| 8 | AH | 1 | 2007 | 140 | 6 | 17 | 7 | 6 |
| 8 | AH | 1 | 2008 | 140 | 3 | 15 | 7 | 7 |



| OUTPUTS | | | | EXPENDITURE | | | | |
|---|---|---|---|---|---|---|---|---|
| Outpatient | Inpatient | Vaccinations | Births | Personnel | Infrastructure + Utilities | Medical supplies + pharmaceuticals | Administration and training | Non-medical |
| 154,933 | 12,482 | 116,424 | 746 | 24,709,566 | 847,601 | 3,032,849 | 91,865 | 97,664 |
| 68,949 | 5,671 | 42,972 | 1,957 | 5,742,125 | 369,440 | 630,000 | 50,200 | 211,385 |
| 67,954 | 7,225 | 5,235 | 2,565 | 6,172,623 | 516,850 | 830,094 | 50,108 | 218,621 |
| 80,131 | 6,889 | 54,336 | 2,393 | 8,006,644 | 398,158 | 1,096,624 | 31,133 | 209,748 |
| 82,296 | 6,827 | 53,527 | 1,816 | 8,986,551 | 398,625 | 1,541,812 | 47,743 | 160,763 |
| 80,186 | 6,037 | 53,222 | 1,944 | 9,575,378 | 476,207 | 2,364,473 | 23,274 | 226,922 |
| 12,107 | 236 | 0 | 44 | 2,221,188 | 73,913 | 339,129 | 32,567 | 119,450 |
| 12,627 | 311 | 0 | 44 | 3,075,069 | 65,182 | 362,898 | 93,600 | 87,980 |
| 6,445 | 276 | 0 | 205 | 3,266,453 | 25,121 | 334,257 | 116,554 | 152,301 |
| 6,390 | 50 | 0 | 65 | 5,300,835 | 54,182 | 294,391 | 87,000 | 20,000 |
| 6,723 | 49 | 12,492 | 58 | 6,074,384 | 17,800 | 32,660 | 150,114 | 50,960 |
| 8,520 | 572 | 0 | 43 | 2,431,366 | 128,607 | 296,996 | 0 | 42,752 |
| 11,035 | 735 | 0 | 52 | 2,942,763 | 139,641 | 318,584 | 0 | 51,805 |
| 14,459 | 1,047 | 0 | 56 | 3,770,641 | 137,392 | 361,182 | 0 | 91,027 |
| 15,363 | 1,047 | 0 | 67 | 4,317,076 | 165,227 | 411,926 | 0 | 99,710 |
| 12,220 | 1,060 | 0 | 72 | 4,707,755 | 148,602 | 538,346 | 0 | 59,030 |
| 83 | 0 | 636 | 0 | 408,636 | 11,350 | 0 | 0 | 0 |
| 78,267 | 5,440 | 68,073 | 493 | 1,724,198 | 231,136 | 630,000 | 2,877 | 60,460 |
| 83,293 | 6,171 | 71,763 | 489 | 3,930,808 | 1,180,719 | 825,000 | 12,900 | 194,824 |
| 77,737 | 6,466 | 65,889 | 375 | 3,815,112 | 875,640 | 840,597 | 12,206 | 70,259 |
| 70,690 | 7,896 | 59,087 | 348 | 8,317,308 | 911,762 | 1,415,232 | 95,675 | 129,743 |
| 75,126 | 6,214 | 67,372 | 391 | 9,068,412 | 1,163,824 | 2,131,228 | 469,703 | 186,749 |
| 18,673 | 235 | 18,673 | 43 | 2,896,774 | 48,472 | 300,368 | 16,476 | 14,262 |
| 18,755 | 244 | 18,755 | 59 | 3,347,338 | 54,051 | 323,780 | 26,616 | 14,564 |
| 18,472 | 245 | 18,493 | 39 | 3,743,749 | 61,670 | 632,044 | 33,528 | 17,456 |
| 19,281 | 239 | 620 | 52 | 7,445,916 | 82,157 | 339,410 | 46,486 | 19,678 |
| 18,725 | 210 | 644 | 78 | 9,436,298 | 89,930 | 486,606 | 40,726 | 24,560 |
| 28,587 | 231 | 583 | 53 | 1,633,872 | 29,461 | 358,569 | 3,056 | 0 |
| 32,587 | 110 | 609 | 55 | 1,597,680 | 28,897 | 384,531 | 13,000 | 0 |
| 32,739 | 271 | 0 | 49 | 2,201,556 | 27,039 | 145,990 | 5,000 | 0 |
| 32,913 | 313 | 0 | 62 | 2,132,328 | 37,412 | 296,771 | 19,450 | 0 |
| 23,210 | 427 | 5,849 | 69 | 2,898,372 | 28,740 | 710,198 | 23,000 | 31,800 |
| 79,579 | 0 | 0 | 0 | 10,745,212 | 409,268 | 0 | 18,706 | 132,458 |
| 245,156 | 27,226 | 9,261 | 1,880 | 19,587,400 | 1,920,592 | 5,950 | 102,068 | 12,238,910 |
| 288,603 | 24,753 | 8,506 | 1,853 | 78,675,392 | 2,063,574 | 8,107,704 | 150,000 | 17,562,100 |
| 338,059 | 21,951 | 7,028 | 1,591 | 91,405,608 | 3,424,752 | 13,945,480 | 249,000 | 2,795,610 |
| 337,031 | 22,842 | 6,906 | 1,925 | 152,830,688 | 3,600,261 | 43,038,936 | 260,000 | 2,750,000 |
| 97,732 | 8,672 | 47,850 | 1,204 | 5,257,840 | 551,935 | 1,540,000 | 19,519 | 1,001,641 |
| 95,359 | 8,612 | 56,599 | 997 | 5,757,940 | 511,331 | 1,940,000 | 33,835 | 730,394 |

| FACILITY INFORMATION | | | | INPUTS (BEDS & STAFF) | | | | |
|---|---|---|---|---|---|---|---|---|
| District | Platform | Facility | Year | Beds | Doctors | Nurses | Para-medical | Non-medical |
| 8 | AH | 1 | 2009 | 140 | 7 | 13 | 4 | 3 |
| 8 | AH | 1 | 2010 | 140 | 6 | 14 | 4 | 2 |
| 8 | AH | 1 | 2011 | 140 | 6 | 12 | 4 | 2 |
| 8 | CHC | 1 | 2007 | 50 | 4 | 3 | 5 | 4 |
| 8 | CHC | 1 | 2008 | 50 | 5 | 2 | 5 | 4 |
| 8 | CHC | 1 | 2009 | 50 | 6 | 2 | 5 | 4 |
| 8 | CHC | 1 | 2010 | 50 | 7 | 12 | 5 | 4 |
| 8 | CHC | 1 | 2011 | 50 | 8 | 11 | 5 | 4 |
| 8 | PHC | 1 | 2007 | 4 | 1 | 2 | 7 | 1 |
| 8 | PHC | 1 | 2008 | 4 | 1 | 2 | 7 | 1 |
| 8 | PHC | 1 | 2009 | 4 | 1 | 2 | 7 | 1 |
| 8 | PHC | 1 | 2010 | 4 | 1 | 1 | 7 | 1 |
| 8 | PHC | 1 | 2011 | 4 | 1 | 2 | 7 | 1 |
| 8 | PHC | 2 | 2007 | 4 | 2 | 1 | 13 | 4 |
| 8 | PHC | 2 | 2008 | 4 | 2 | 1 | 13 | 4 |
| 8 | PHC | 2 | 2009 | 4 | 2 | 1 | 14 | 4 |
| 8 | PHC | 2 | 2010 | 4 | 2 | 1 | 13 | 5 |
| 8 | PHC | 2 | 2011 | 4 | 2 | 1 | 14 | 5 |
| 8 | CHC | 2 | 2007 | 60 | 8 | 12 | 13 | 11 |
| 8 | CHC | 2 | 2008 | 60 | 6 | 13 | 15 | 10 |
| 8 | CHC | 2 | 2009 | 60 | 6 | 14 | 16 | 9 |
| 8 | CHC | 2 | 2010 | 60 | 7 | 15 | 15 | 9 |
| 8 | CHC | 2 | 2011 | 60 | 5 | 16 | 16 | 9 |
| 8 | PHC | 3 | 2007 | 6 | 1 | 1 | 11 | 3 |
| 8 | PHC | 3 | 2008 | 6 | 3 | 1 | 11 | 3 |
| 8 | PHC | 3 | 2009 | 6 | 3 | 1 | 10 | 4 |
| 8 | PHC | 3 | 2010 | 6 | 3 | 1 | 10 | 4 |
| 8 | PHC | 3 | 2011 | 6 | 2 | 1 | 10 | 4 |
| 8 | PHC | 4 | 2007 | 4 | 2 | 1 | 16 | 2 |
| 8 | PHC | 4 | 2008 | 4 | 2 | 1 | 15 | 2 |
| 8 | PHC | 4 | 2009 | 4 | 2 | 1 | 15 | 2 |
| 8 | PHC | 4 | 2010 | 4 | 2 | 1 | 16 | 3 |
| 8 | PHC | 4 | 2011 | 4 | 2 | 1 | 13 | 3 |
| 9 | AH | 1 | 2007 | 135 | 15 | 27 | 15 | 27 |
| 9 | AH | 1 | 2008 | 135 | 15 | 28 | 17 | 31 |
| 9 | AH | 1 | 2009 | 135 | 16 | 26 | 15 | 21 |
| 9 | AH | 1 | 2010 | 135 | 15 | 31 | 21 | 21 |
| 9 | AH | 1 | 2011 | 135 | 16 | 31 | 21 | 21 |
| 9 | CHC | 1 | 2007 | 30 | 4 | 7 | 3 | 4 |



| OUTPUTS | | | | EXPENDITURE | | | | |
|---|---|---|---|---|---|---|---|---|
| Outpatient | Inpatient | Vaccinations | Births | Personnel | Infrastructure + Utilities | Medical supplies + pharmaceuticals | Administration and training | Non-medical |
| 88,415 | 8,718 | 54,986 | 916 | 7,864,382 | 592,941 | 2,686,093 | 76,269 | 756,997 |
| 97,841 | 11,912 | 74,813 | 1,386 | 9,503,596 | 824,004 | 2,057,392 | 53,232 | 772,477 |
| 92,987 | 9,739 | 57,910 | 1,583 | 7,768,393 | 898,333 | 4,830,641 | 130,590 | 691,034 |
| 6,388 | 2,269 | 25,861 | 32 | 4,041,740 | 208,995 | 630,000 | 67,758 | 136,580 |
| 6,066 | 2,553 | 21,957 | 80 | 4,091,184 | 193,669 | 825,000 | 31,446 | 51,230 |
| 4,323 | 3,190 | 27,797 | 196 | 4,541,983 | 765,771 | 960,131 | 53,773 | 209,254 |
| 7,532 | 4,075 | 28,583 | 350 | 5,137,211 | 257,338 | 942,124 | 35,386 | 87,303 |
| 9,410 | 3,987 | 33,036 | 97 | 6,108,626 | 337,222 | 2,016,007 | 32,084 | 163,390 |
| 28,904 | 128 | 14,942 | 128 | 2,839,327 | 28,865 | 221,532 | 169,303 | 23,450 |
| 28,871 | 84 | 14,983 | 85 | 2,512,207 | 158,401 | 237,636 | 109,983 | 29,050 |
| 21,479 | 64 | 15,294 | 64 | 3,433,418 | 18,169 | 186,192 | 124,936 | 47,000 |
| 21,413 | 115 | 18,522 | 115 | 4,187,743 | 27,769 | 127,866 | 118,777 | 47,350 |
| 25,691 | 134 | 22,345 | 134 | 4,859,387 | 18,419 | 295,370 | 22,548 | 54,700 |
| 34,578 | 1,680 | 16,908 | 240 | 2,725,798 | 90,407 | 319,372 | 20,156 | 221,961 |
| 34,019 | 1,356 | 17,058 | 255 | 3,047,795 | 97,021 | 366,429 | 13,612 | 384,225 |
| 34,409 | 1,449 | 17,065 | 243 | 3,775,428 | 85,921 | 252,752 | 15,220 | 436,660 |
| 36,407 | 1,812 | 17,661 | 250 | 4,199,527 | 93,454 | 235,139 | 21,800 | 304,440 |
| 42,815 | 2,282 | 18,632 | 234 | 4,964,395 | 101,107 | 501,959 | 33,021 | 347,785 |
| 143,140 | 4,416 | 61,373 | 30 | 6,379,424 | 357,537 | 835,890 | 141,745 | 248,953 |
| 145,114 | 3,985 | 67,075 | 12 | 6,489,356 | 312,444 | 1,018,641 | 156,901 | 162,720 |
| 141,236 | 4,899 | 62,060 | 44 | 6,511,316 | 329,323 | 1,386,651 | 289,628 | 280,832 |
| 106,682 | 6,344 | 54,238 | 69 | 10,265,867 | 387,664 | 1,329,424 | 240,675 | 365,360 |
| 99,058 | 4,492 | 54,079 | 135 | 8,779,498 | 357,942 | 2,719,005 | 243,005 | 361,364 |
| 16,179 | 169 | 9,808 | 51 | 4,398,120 | 103,598 | 258,557 | 9,370 | 907 |
| 15,096 | 196 | 9,788 | 49 | 5,664,780 | 116,754 | 274,718 | 3,115 | 1,500 |
| 21,179 | 244 | 9,658 | 64 | 5,886,506 | 120,647 | 195,109 | 9,045 | 2,660 |
| 27,035 | 429 | 9,499 | 49 | 6,268,373 | 122,812 | 330,532 | 7,294 | 2,917 |
| 25,771 | 470 | 10,135 | 45 | 6,380,490 | 106,796 | 634,272 | 7,170 | 4,000 |
| 14,509 | 311 | 9,202 | 162 | 1,950,058 | 129,049 | 256,631 | 0 | 495,241 |
| 10,122 | 336 | 10,186 | 162 | 1,963,678 | 149,837 | 275,723 | 0 | 614,212 |
| 9,710 | 247 | 10,469 | 60 | 2,146,776 | 142,447 | 217,737 | 0 | 865,010 |
| 9,346 | 201 | 10,020 | 38 | 3,741,444 | 252,087 | 413,374 | 79,050 | 164,322 |
| 11,581 | 181 | 10,089 | 29 | 2,877,470 | 123,976 | 797,114 | 0 | 29,900 |
| 152,952 | 18,372 | 36,703 | 693 | 55,562,156 | 432,314 | 1,765,709 | 46,438 | 503,638 |
| 133,512 | 19,392 | 37,274 | 420 | 57,904,828 | 364,970 | 1,963,448 | 33,307 | 819,660 |
| 139,071 | 18,844 | 13,080 | 592 | 65,824,040 | 1,302,591 | 2,112,095 | 27,298 | 1,362,512 |
| 140,807 | 23,208 | 13,722 | 779 | 77,921,680 | 931,348 | 3,014,077 | 49,931 | 1,482,457 |
| 138,259 | 20,845 | 13,971 | 284 | 91,644,776 | 471,073 | 5,006,899 | 10,867 | 674,048 |
| 39,468 | 7,725 | 960 | 547 | 214,185 | 205,169 | 583,536 | 0 | 0 |

| FACILITY INFORMATION | | | | INPUTS (BEDS & STAFF) | | | | |
|---|---|---|---|---|---|---|---|---|
| District | Platform | Facility | Year | Beds | Doctors | Nurses | Para-medical | Non-medical |
| 9 | CHC | 1 | 2008 | 30 | 3 | 8 | 3 | 4 |
| 9 | CHC | 1 | 2009 | 30 | 4 | 8 | 2 | 4 |
| 9 | CHC | 1 | 2010 | 30 | 4 | 8 | 3 | 3 |
| 9 | CHC | 1 | 2011 | 30 | 4 | 9 | 4 | 5 |
| 9 | PHC | 1 | 2007 | 4 | 2 | 1 | 11 | 2 |
| 9 | PHC | 1 | 2008 | 4 | 2 | 1 | 10 | 2 |
| 9 | PHC | 1 | 2009 | 4 | 2 | 1 | 11 | 2 |
| 9 | PHC | 1 | 2010 | 4 | 2 | 1 | 10 | 2 |
| 9 | PHC | 1 | 2011 | 4 | 2 | 1 | 8 | 2 |
| 9 | DH | 1 | 2007 | 100 | 16 | 29 | 29 | 15 |
| 9 | DH | 1 | 2008 | 100 | 16 | 29 | 29 | 17 |
| 9 | DH | 1 | 2009 | 100 | 16 | 29 | 29 | 17 |
| 9 | DH | 1 | 2010 | 100 | 21 | 33 | 28 | 18 |
| 9 | DH | 1 | 2011 | 100 | 21 | 33 | 28 | 18 |
| 9 | CHC | 2 | 2007 | 13 | 7 | 6 | 11 | 2 |
| 9 | CHC | 2 | 2008 | 13 | 7 | 6 | 14 | 2 |
| 9 | CHC | 2 | 2009 | 13 | 8 | 6 | 16 | 2 |
| 9 | CHC | 2 | 2010 | 13 | 8 | 6 | 16 | 2 |
| 9 | CHC | 2 | 2011 | 13 | 6 | 6 | 16 | 2 |
| 9 | DH | 1 | 2007 | 100 | 12 | 20 | 45 | 13 |
| 9 | PHC | 2 | 2007 | 0 | 2 | 5 | 13 | 2 |
| 9 | PHC | 2 | 2008 | 0 | 2 | 5 | 13 | 2 |
| 9 | PHC | 2 | 2009 | 0 | 2 | 5 | 13 | 2 |
| 9 | PHC | 2 | 2010 | 0 | 2 | 5 | 15 | 2 |
| 9 | PHC | 2 | 2011 | 0 | 2 | 5 | 14 | 2 |
| 9 | PHC | 3 | 2007 | 10 | 2 | 1 | 8 | 5 |
| 9 | PHC | 3 | 2008 | 10 | 2 | 1 | 8 | 4 |
| 9 | PHC | 3 | 2009 | 10 | 2 | 1 | 7 | 4 |
| 9 | PHC | 3 | 2010 | 10 | 2 | 1 | 9 | 3 |
| 9 | PHC | 3 | 2011 | 10 | 2 | 1 | 8 | 4 |
| 9 | PHC | 4 | 2007 | 4 | 1 | 1 | 10 | 2 |
| 9 | PHC | 4 | 2008 | 4 | 1 | 1 | 11 | 2 |
| 9 | PHC | 4 | 2009 | 4 | 1 | 1 | 11 | 2 |
| 9 | PHC | 4 | 2010 | 4 | 2 | 1 | 10 | 2 |
| 9 | PHC | 4 | 2011 | 4 | 2 | 1 | 10 | 3 |



| OUTPUTS | | | | EXPENDITURE | | | | |
|---|---|---|---|---|---|---|---|---|
| Outpatient | Inpatient | Vaccinations | Births | Personnel | Infrastructure + Utilities | Medical supplies + pharmaceuticals | Administration and training | Non-medical |
| 58,080 | 8,019 | 1,084 | 542 | 197,831 | 129,069 | 626,020 | 0 | 0 |
| 66,815 | 9,092 | 1,145 | 588 | 184,100 | 153,170 | 368,215 | 0 | 0 |
| 75,829 | 8,647 | 1,382 | 690 | 318,446 | 169,206 | 204,339 | 0 | 0 |
| 85,158 | 11,390 | 2,484 | 883 | 821,934 | 242,954 | 469,695 | 0 | 0 |
| 12,995 | 181 | 0 | 27 | 2,001,472 | 40,325 | 432,363 | 1,603 | 263,945 |
| 13,843 | 178 | 0 | 31 | 2,181,499 | 42,790 | 464,334 | 1,540 | 335,830 |
| 14,190 | 159 | 0 | 36 | 2,547,474 | 37,317 | 287,390 | 2,040 | 356,905 |
| 15,049 | 153 | 0 | 36 | 2,882,732 | 34,986 | 211,084 | 2,142 | 428,135 |
| 16,143 | 152 | 0 | 33 | 3,159,328 | 40,710 | 399,519 | 2,100 | 451,353 |
| 88,803 | 12,122 | 16,529 | 684 | 11,386,780 | 913,218 | 1,758,768 | 1,067,660 | 271,416 |
| 96,189 | 13,664 | 13,007 | 793 | 12,880,815 | 523,095 | 1,974,133 | 325,167 | 338,460 |
| 95,184 | 15,355 | 16,990 | 789 | 14,149,755 | 1,714,244 | 1,754,404 | 565,290 | 512,889 |
| 88,411 | 14,585 | 17,722 | 996 | 16,153,901 | 1,167,475 | 2,877,621 | 470,518 | 360,349 |
| 83,470 | 13,814 | 13,123 | 1,836 | 20,210,028 | 1,364,331 | 4,008,601 | 882,848 | 117,055 |
| 46,083 | 1,947 | 37,751 | 0 | 1,846,044 | 242,286 | 424,500 | 41,250 | 58,300 |
| 45,038 | 2,160 | 39,619 | 0 | 3,088,452 | 189,388 | 535,000 | 49,324 | 56,120 |
| 45,031 | 2,412 | 36,262 | 0 | 4,669,836 | 145,461 | 616,415 | 7,833 | 53,520 |
| 45,363 | 3,821 | 36,577 | 0 | 4,755,528 | 268,477 | 744,784 | 3,193 | 99,951 |
| 54,296 | 4,892 | 35,352 | 0 | 5,980,471 | 229,971 | 966,610 | 2,225 | 99,140 |
| 97,288 | 20,544 | 5,574 | 1,815 | 21,790,288 | 828,692 | 1,943,579 | 51,989 | 438,498 |
| 41,420 | 453 | 9,437 | 0 | 1,321,990 | 109,752 | 598,975 | 437 | 0 |
| 41,915 | 463 | 8,993 | 0 | 1,328,510 | 110,962 | 638,967 | 137 | 0 |
| 40,547 | 405 | 9,758 | 0 | 1,526,013 | 108,067 | 442,285 | 2,551 | 0 |
| 39,877 | 598 | 10,265 | 0 | 1,817,018 | 110,292 | 600,146 | 3,075 | 190,600 |
| 35,746 | 752 | 10,329 | 0 | 2,025,678 | 115,179 | 515,196 | 5,000 | 0 |
| 4,990 | 952 | 13,580 | 93 | 2,666,724 | 161,884 | 529,188 | 19,340 | 18,117 |
| 5,007 | 540 | 13,033 | 72 | 3,349,584 | 199,010 | 563,035 | 21,920 | 20,345 |
| 4,651 | 645 | 13,360 | 57 | 3,930,320 | 218,947 | 454,258 | 23,042 | 39,116 |
| 4,550 | 563 | 13,818 | 57 | 4,558,500 | 292,787 | 349,792 | 28,848 | 48,751 |
| 4,604 | 635 | 14,561 | 62 | 5,711,260 | 352,435 | 480,563 | 32,600 | 55,904 |
| 12,206 | 794 | 12,206 | 66 | 2,192,370 | 70,944 | 344,821 | 0 | 0 |
| 13,714 | 397 | 538 | 74 | 2,741,372 | 74,271 | 369,743 | 0 | 0 |
| 13,450 | 435 | 13,450 | 35 | 3,107,470 | 77,386 | 151,755 | 0 | 0 |
| 11,752 | 757 | 12,883 | 59 | 3,042,108 | 62,806 | 347,257 | 0 | 74,989 |
| 12,041 | 770 | 402 | 43 | 3,078,179 | 124,803 | 447,065 | 0 | 287 |

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