The Impact of Population Growth on Development in Sindh

Findings from the Resources for the Awareness of Population Impacts on Development Model

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CIP Secretariat
Costed Implementation Plan
Population Welfare Department
Government of Sindh
RAPID IS AVAILABLE AS AN APP FOR APPLE AND ANDROID DEVICES
Acknowledgments

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About RAPID

This resource presents findings from the RAPID (Resources for the Awareness of Population Impacts on Development) model, which projects the social and economic consequences of rapid population growth on various health and non-health sectors. The RAPID model is a computer program that makes projections of social and economic indicators for countries or regions. These indicators include various social and economic indicators such as labour force participation rate, school enrolment rates, and the number of nurses and doctors per capita, to name a few. The model itself is pre-loaded with country-specific default data, which is then updated with more specific data and inputs, as relevant. Inputted data is then combined with population projections (created in the DemProj module of Spectrum and based on either census, Demographic and Health Survey, or other available population statistics) to project the future requirements of the indicators for as much as 50 years into the future.

Specific to this application, data sources are noted throughout the booklet and correspond with the relevant topics. Data was validated and updated, as needed, from a validation meeting in Sindh in December 2016 (participant organizations and departments are noted in the acknowledgments). Following the release of new census data for Sindh, HP+ updated the model and those new outputs are reflected throughout this booklet. Supported by USAID, RAPID has been applied in numerous countries and driven countless policy decisions over the past three decades. This is the first application of RAPID specific to Sindh.
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Population and Development

Slower population growth, more resources available

Understanding the impact of population growth on socioeconomic development is essential in making strategic policy and program decisions. Continued rapid population growth and urbanization in Sindh will increase pressure on its health, education, economic, and agricultural sectors to meet the population’s demand for basic needs. Slowing population growth through increased use of family planning will allow Sindh to invest more in long-term measures to improve the quality of health services, guarantee universal education, expand employment opportunities, and attain food security. If strategically implemented, these measures could catalyse progress toward a healthier, more prosperous country and population.
Sindh’s Population

Rapidly growing

Sindh is experiencing rapid population growth—the result of high fertility rates coupled with decreased mortality rates. In the past decade, the population grew by just over 10 million (almost 30%)—from 38 million in 2006 to 47.8 million in 2017.¹ Karachi, the capital of Sindh, has the twelfth largest urban population globally and is projected to have the seventh largest by 2030.²

Sindh’s total fertility rate—a measure of the average number of children a woman will have over her lifetime—has decreased slightly over time. It fell from 5.1 children per woman in 1990 to 4 in 2014. Fertility in Sindh remains considerably higher in rural areas (5.2) compared to urban areas (3.2).³

Age Structure

An expanding young cohort

The overall population is skewed toward young people, a group that increased from approximately 16 million in 1998 to 23 million in 2016. Young people under the age of 19 make up 50% of the population. Therefore, even if fertility declines, Sindh’s population will continue to grow rapidly because of the high number of young women who will soon enter their reproductive years.

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Population in 2050

Two scenarios

Sindh’s population in 2050 will largely be influenced by future fertility trends.

**Constant CPR:** If the contraceptive prevalence rate (CPR) remains constant—at 29.5%—the population will grow from 47.8 million in 2017 to 98.5 million by 2050—nearly doubling in just 29 years.

**High CPR:** If CPR increases to 45% by 2020, and then reaches 70% by 2050, the population will increase to 70.5 million by 2050.

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9 Avenir Health (RAPID Model), 2017.
11 Avenir Health (RAPID Model), 2017.
Impact on Future Development

Consequences for key sectors

Continued rapid population growth will have consequences for six key development sectors in Sindh:

- Health
- Education
- Economy
- Agriculture
- Water
- Urbanization
HEALTH
Status of Health Sector

More caregivers and infrastructure needed

Considerable efforts are needed to adequately address the health needs of Sindh’s growing population—tackling human resource shortages and making services more accessible is critical. In Sindh, over half of women face challenges in accessing healthcare. Among women in rural Sindh, distance is a challenge for 68% of women and transportation is a challenge for 76% of women, highlighting the urgent need to make health services more accessible. Further, despite high regard for the lady health worker programme, which is intended to provide basic health services, including family planning, just over half of women are aware of lady health workers in their area.¹²

Health Professionals

Increasing demand for trained doctors and nurses

In 2016, there were about 15,252 doctors and 3,844 nurses in Sindh. By 2050, a projected 9,860 nurses and 49,299 doctors will be needed under the constant CPR scenario (29.5%), compared with 7,053 nurses and 35,263 doctors under the high CPR scenario (70%).

16,843 fewer doctors and nurses needed by 2050 if CPR is increased to 70%

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13 Data, originally from Bureau of Statistics, Planning & Development Department, Sindh, 2013, was revised during the HP+ RAPID Validation Workshop in December 2016 in Karachi.
14 Avenir Health (RAPID Model), 2017.
Health Units (hospitals and health centres)

Increasing demand for sufficient facilities

There were approximately 1,059 health units in Sindh in 2016—88% of which were primary health units (health posts or health centres). The number of hospitals in 2016 was estimated at 122 for the entire province.\textsuperscript{15} By 2050, a projected 3,616 health units will be needed under the constant CPR scenario (29.5%), compared with 2,586 health units under the high CPR scenario (70%).\textsuperscript{16}

\textsuperscript{15} Data, originally from Bureau of Statistics, Planning & Development Department, Sindh, 2013, was revised during the HP+ RAPID Validation Workshop in December 2016 in Karachi.

\textsuperscript{16} Avenir Health (RAPID Model), 2017.
Annual Health Expenditure

PKR 1.3 trillion can be saved by 2050

Improvements to health system capacity, infrastructure, and outcomes require financial resources, and more resources will be required under a higher fertility scenario. To meet future capacity and infrastructure requirements, the Department of Health, Sindh will need to increase annual recurrent health expenditures to PKR 381 billion by 2050 under the constant CPR scenario versus 272 billion with a high CPR.¹⁷

Cumulative Health Savings by 2050

Expenditure (PKR billions)

Constant CPR

High CPR

PKR 1.3 trillion cumulative savings by 2050 if CPR increases to 70%

World Bank, 2014.
Avenir Health (RAPID Model), 2017.
“Education is one of the most important pillars of government through which government enhances technical and professional skills of its people so that they can play their due role in the development of the country.”

– Government of Sindh, School Education & Literacy Department
Students

Increasing numbers of school-age children

Many children in Pakistan are in need of schooling. In terms of need, if Sindh experiences the constant CPR scenario (29.5%), around 12.3 million children will be of primary school age by 2050. If Sindh achieves the high CPR scenario (70%), the number of children of primary school age will be more than halved, to 5.8 million. Moreover, the number of children of secondary school age is projected to reach 2.3 million by 2050, yet, under the high CPR scenario, this could decrease to 1.4 million children.

19 Education and Literacy Department, Sindh, 2014.
20 Avenir Health (RAPID Model), 2017.
Teachers

Increasing demand for qualified teachers

Sindh’s teacher-to-student ratio was 1 teacher for every 30 students in 2011.21 Assuming an ideal ratio of 1 to 25 by 2050, Sindh will need an extra 607,849 teachers (primary and secondary) by 2050 under the constant CPR scenario, compared to an extra 300,617 teachers under the high CPR scenario.22

21 Education and Literacy Department, Government of Sindh, 2014.
22 Avenir Health (RAPID Model), 2017.
Schools

Vast infrastructure improvements, more schools needed

In 2011, there were 43,089 primary schools in Sindh, many in need of infrastructure improvements to increase functionality. Further, Sindh has experienced an imbalance in the number of schools, between primary, middle, and high schools, based on overall need. This imbalance is further seen in resource distribution across schools, with most resources (53%) going to middle schools and the smallest amount (15%) going to primary schools.23

In addition to meeting the already existing, and urgent, infrastructure needs, as Sindh’s population grows and more children enter school age, these needs will only increase as the issues and challenges become more severe.

23 Alif Ailaan, 2016.
Students, Teachers, and Schools

By 2050, more students will require more teachers and schools under the constant CPR scenario\textsuperscript{24}

7.4 million more school children to educate

307 thousand more teachers needed

69 thousand more schools needed

\textsuperscript{24} Education and Literacy Department, Government of Sindh, 2014. Avenir Health (RAPID Model), 2017.
School Expenditure

PKR 1.2 trillion can be saved by 2050

To meet future capacity and infrastructure requirements, Sindh’s Education and Literacy Department will need to increase primary school expenditures to PKR 170 billion by 2050 under the constant CPR scenario (29.5%), compared to PKR 80 billion under the high CPR scenario (70%). Similarly, the required secondary school expenditures will be PKR 32 billion and PKR 18 billion, respectively. When comparing the two scenarios, there is a cumulative total savings of PKR 1.2 trillion under high CPR from 2016 to 2050. These resources are needed to guarantee sufficient numbers of qualified, trained teachers and can be used to build new schools and improve and update current infrastructure.

“Sindh, Pakistan’s second largest province plays a pivotal role in the national economic and development agenda.”

– Sindh Board of Investment
Economic Sector

Population’s impact on the economy

Pakistan’s economy has recently grown at approximately 4.7% per year\textsuperscript{26}; Sindh enjoys a similar growth rate and contributes to national growth.\textsuperscript{27} The GDP per capita for Sindh is PKR 159,678, above average for the country.\textsuperscript{28} A rapidly growing population will affect Sindh’s ability to expand the labour force and improve economic performance.

\textsuperscript{26} World Bank, 2014.
\textsuperscript{27} Sindh Board of Investment, 2017.
\textsuperscript{28} World Bank, 2014.

* Avenir Health (RAPID Model), 2017.
Growing working-age population, requiring more jobs

Sindh’s working age population is currently about 26 million.29 If the CPR remains constant, 882,140 additional jobs will be needed to employ the working-age population in 2050. This figure can be greatly reduced if the country’s CPR increases to 45% by 2020 and then 70% by 2050.30

30 Avenir Health (RAPID Model), 2017.
Child Dependents

Constant CPR results in more dependents

If CPR remains constant, there will be more than 34 million child dependents in Sindh by 2050. If the CPR rate is increased, this number is projected to fall to 15 million, permitting greater investments in health and education per child.

19 million fewer child dependents by 2050 if CPR is increased to 70%

32 Avenir Health (RAPID Model), 2017.
“The economic development of Sindh largely depends on the process and the growth of the agriculture sector.”

– Agriculture, Supply, and Prices Department, Government of Sindh
In Sindh, approximately 40% of the land is arable and 5.08 million hectares are currently used for agriculture. Rapid population growth often leads to dense settlements that put pressure on the land and other natural areas as families seek to meet their needs for sustenance. Intensive agricultural production often leads to soil degradation, erosion, and increased salinity, which results in lower productivity. While this decline can occur in just a few years, it takes decades to restore land productivity.
Wheat Production and Demand

Population’s impact on food security

In 2016, wheat production was 3.3 million metric tons per year for a population of approximately 46 million.\textsuperscript{34} Population growth creates greater demand for food, thereby increasing costs and diminishing access to food for domestic consumption; this disproportionately affects the country’s poorest residents.

\textsuperscript{34} Data, originally from Pakistan Bureau of Statistics, 2011b, was revised during the HP+ RAPID Validation Workshop in December 2016 in Karachi.

\textbf{3.7 million tons}

more wheat consumed by 2050 if CPR remains constant at 29.5%* 

* Avenir Health (RAPID Model), 2017.
“Water is the critical resource for humanity. No life can exist without water.”

– Karachi Water and Sewerage Board
Water

Ensuring water availability meets total consumption

Water scarcity in Sindh, especially in the face of rapid population growth, is a serious threat. Current estimates suggest that there is about 110–121 billion m$^3$ (cubic metres) of available water in Sindh, enough to meet yearly consumption.\footnote{Agriculture Extension, Government of Sindh, 2016.} If the population continues to grow at its current rate (assuming the constant CPR estimate of 29.5%), total water consumption will hit a critical point by 2040, reaching an estimated 110 billion m$^3$. By 2050, total water consumption will reach 136 billion m$^3$ (exceeding the projected 110–121 billion m$^3$ of available water) and Sindh will not have enough water. However, under the high CPR scenario, water consumption will only reach 97.8 billion m$^3$, which will not outpace total water availability.\footnote{Avenir Health (RAPID Model), 2017.}

Water consumption is only one factor affecting the province’s water supply. Additional water conservation and environmental protection efforts are needed to ensure the viability of the water supply for future generations.
Water Consumption

High and constant CPR scenarios

136 billion m$^3$

97.8 billion m$^3$

12.2 billion m$^3$

of water can be saved by 2050 if CPR increases to 70%

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“Karachi, the capital of Sindh, has the twelfth largest urban population globally. By 2030, it will have the seventh largest in the world.”

– Asian Development Bank
Urban Growth Outcomes

Fertility’s impact on urban population

Sindh’s urban population is growing. In 2014, over one in three (39%) lived in urban areas. If urban population growth remains the same, it is projected that urban areas will house 59 million people in the constant CPR scenario (29.5%)—of whom 15 million will be urban youth (15–24 years old). Under the high CPR scenario (70%), the population living in urban centres decreases considerably to a projected 42 million (28% decrease), with urban youth at 9.7 million (35% decrease).

Urban Population and Households

By 2050, a constant CPR will result in more urban youth, adults, and households.40

- 5.4 million more urban youth
- 17 million more people living in urban areas
- 2.8 million more urban households needed

Households

Increasing number of households, increased strain on resources

The number of new households is also expected to increase.\textsuperscript{41} By 2050, the constant scenario will create an additional 2.8 million urban households relative to the high CPR scenario.\textsuperscript{42} With an increase in the number of households, comes increased strain on access to resources such as electricity, water, and transportation.

\textsuperscript{41} Sindh Bureau of Statistics and UNICEF, 2015.
\textsuperscript{42} Avenir Health (RAPID Model), 2017.
If Sindh’s CPR remains constant, its population will double by 2050, increasing pressure to adequately meet the needs of an estimated 98.5 million people. However, if CPR is increased, population pressures will be reduced across all sectors, leading to a more prosperous province.

Avenir Health (RAPID Model), 2017.
Looking to the Future

Investing in family planning leads to positive outcomes across all sectors

Continued rapid population growth in Sindh will increase pressure on the province’s health, education, economic, and agricultural sectors and make it increasingly difficult to meet the population’s basic needs. For Sindh to fulfill its development potential, the province must expand access to equitable, high-quality, and voluntary family planning information, services, and a wide range of methods. Expanding access to family planning programs will require adequate financial backing and alignment of existing social sector investments with population and development goals. Enhanced political will to tackle the challenges associated with population growth is essential. All sectors have a responsibility to advocate for increased investment in family planning programs.

Investment in family planning is not only good for socioeconomic development at the provincial level, it also improves the lives and well-being of individuals and communities. If Sindh can do more to curb rapid population growth and increase its investment in family planning, the province can improve the lives of its citizens and fully realize the benefits of adequate access to education, food, economic opportunity, and vital day-to-day needs, such as electricity and clean water.
References


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