



REFORMS FOR
A BRIGHTER
FUTURE
TIME TO DECIDE

PRELIMINARY DRAFT FOR
CONSULTATIONS AND DISCUSSION

DISCUSSION NOTE I

REDUCING CHILD STUNTING

Sustainable and Climate-Resilient
Solutions to Child Stunting



WORLD BANK GROUP

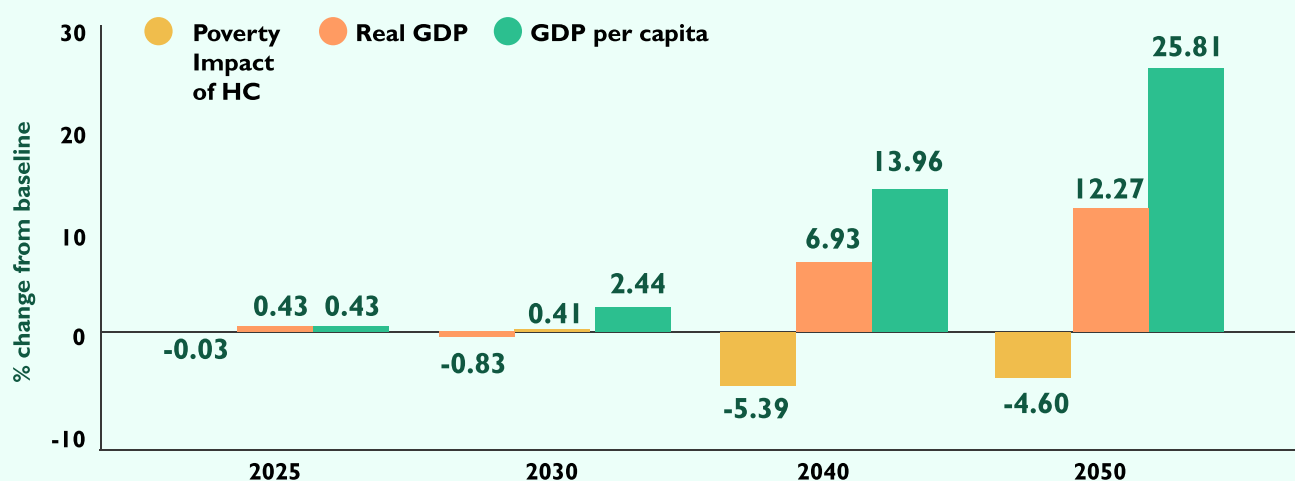
The Problem of Child Stunting

Forty percent of children under five suffer from stunted growth in Pakistan and there has been little progress in reducing child stunting over the past three decades. Stunting has crippling impacts that are largely irreversible, damaging a child’s cognitive and physical capacity, leading to lower educational attainment, lower economic productivity, and reduced income earning potential. Failure to address this public health crisis on an urgent basis is limiting Pakistan’s growth prospects as well as its ability to reduce poverty and improve equality of opportunity. Accelerated progress on child stunting requires a major shift in both policy design and policy implementation. Policy design needs to take into account the critical environmental factors that underly the biological drivers of stunting. The most urgent of these is the reduction of exposure to human and animal fecal waste, especially for infants, through the provision of safe water, sanitation and animal waste management, and comprehensive behaviour change. Pakistan’s exceptionally high fertility rate is another neglected but critical driver of the intergenerational transmission of child stunting. Finally, more attention is needed on dietary quality and diversity. The agri-food system will need to be transformed to deliver food and water security for all – both are at considerable risk due to the environmental degradation caused by conventional agricultural practices, and a rapidly changing climate. Progress will require a multi-sectoral effort, led by empowered federal and provincial bodies, with a clear mandate and adequate resources to implement sectoral and geographic convergence - with a sharp focus on areas and populations that are most deprived.

Potential Costs And Benefits Of Accelerating A Reduction In Child Stunting

Impacts on Growth and Poverty

(By reducing child stunting levels to under 5% and reducing fertility to replacement levels by 2035)



The Cost to Do this

~1% of current GDP for 15 years [USD 3-4 billion per year]

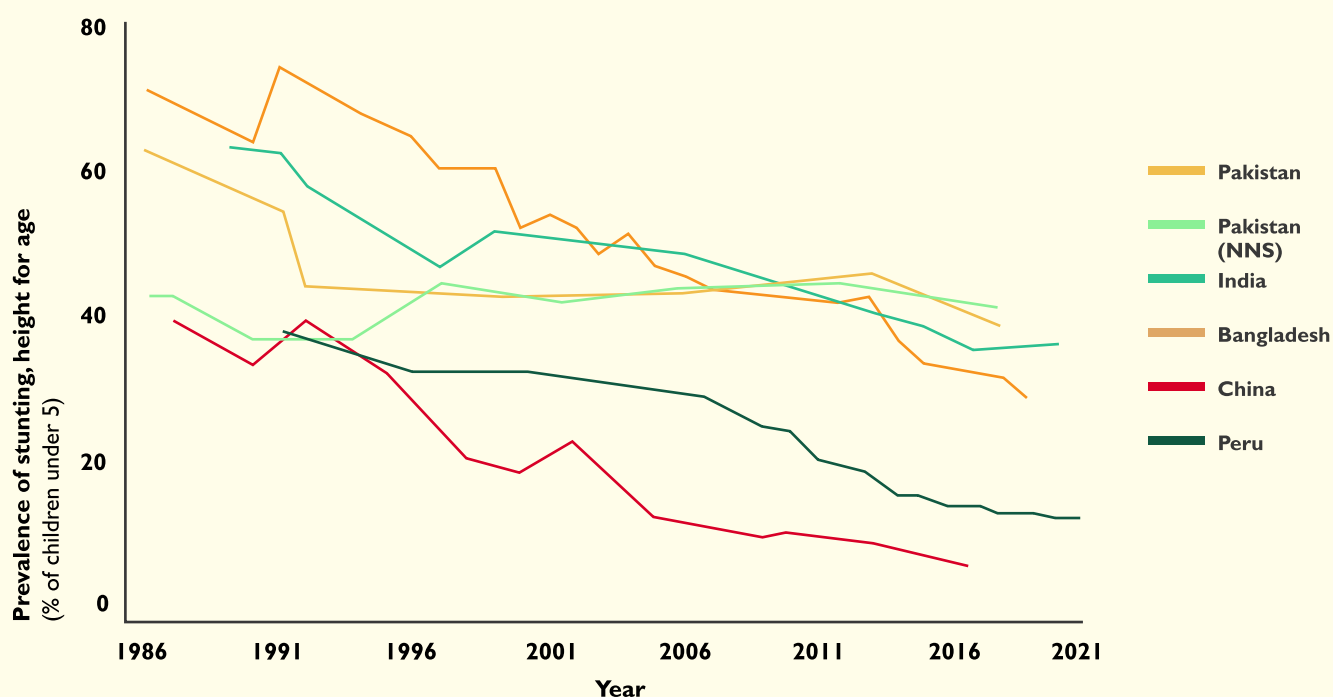
Source: Policy simulation conducted for the Pakistan Country Climate and Development Report (2022)

The Problem

Forty percent of children under five suffer from stunted growth in Pakistan¹.

Pakistan is among the few remaining countries in the world where stunting rates remain this high² and where there has been virtually no progress in reducing child stunting over the past three decades³. Given the rapid growth in population, the number of stunted children in Pakistan has actually been rising substantially over the past few decades.

Figure I: Stunting rates across countries over time



Source: World Bank-World Health Organization. National Nutrition Surveys (Orange line, Pakistan)

Child stunting is a condition or ‘syndrome’ in which multiple pathological changes occur in the first 1000 days of a child’s life, from conception to age 2, that are largely irreversible and have crippling impacts on the children who survive and the societies they live in. Child malnutrition, in all its forms, underlies 45 percent of all child deaths among children less than 5 years, but malnutrition related mortality is just the tip of the iceberg, and the problem with stunting is not the visible height deficit, but the neural damage, reduced physical capacity and immune dysfunction that underly it. Eighty percent of brain development occurs in the first 1000 days. Stunting can severely compromise this, damaging a child’s cognitive and physical capacity. This reduces lifelong learning ability and quality of life and results in low economic productivity and income earning potential as an adult, reinforcing the cycle of poverty and inequality.

¹ A child is considered stunted if his/her height-for-age is more than two standard deviations below the World Health Organization’s (WHO) Child Growth Standards median. WHO. Nutrition Landscape Information System, Country Profile: Interpretation Guide. WHO, Geneva 2010.

² In some provinces like Sindh, one in two children is stunted, and in rural Sindh this number rises to nearly two out of three children.

³ Pakistan ranks 15th from the bottom among countries. It ranks just above Afghanistan, Sudan, Libya, and Angola, all countries which have been severely conflict affected over the past few decades and of which some, like Angola are among the most unequal countries in the world.

Failure to address this public health crisis on an urgent basis is limiting Pakistan's growth prospects as well as its ability to reduce poverty and improve equality of opportunity.

Pakistan ranks 141 out of 174 on the World Bank's Human Capital Index (HCI), implying that a Pakistani child born today is expected to be only 40 percent as productive as they could be by age 18 unless there are significant improvements in human capital outcomes. The risk of metabolic conditions, like diabetes, blood pressure and cardiovascular disease, is also significantly elevated throughout life, further reducing income earning potential and increasing household and societal healthcare costs. Associated losses in per capita income could be as high as 5 to 7 percent.⁴ And the impacts are intergenerational. Women who are stunted in childhood tend to have stunted children, many of whom are born stunted, further reinforcing the cycle of poverty and inequality of opportunity. In the end, this limits the developmental potential of an entire society.

To accelerate progress on child stunting, major shifts in both policy design and policy implementation are needed.

Policy design needs to include attention to critical environmental factors that underly the biological drivers of stunting, and the key factors that adversely impact the physical and mental health of young women. The main focus of interventions aimed at addressing stunting in Pakistan has been on dietary and nutrition related interventions targeted to pregnant and lactating mothers and children under age 2. These include exclusive and early breast feeding, complementary feeding after weaning, dietary and micronutrient supplementation for mothers and infants, and health interventions to manage moderate acute- or severe acute malnutrition and anemia. In some cases, social transfers have also been included to enable the poorest households to improve food security and dietary adequacy.⁵ These interventions are clearly important and correctly focus on the first one thousand days from conception to age 2, the only clear window of opportunity to prevent child stunting. What is missing, however, is the inclusion of critical environmental factors that contribute to neural damage and cognitive impairment and reduce the effectiveness of dietary and nutrition related interventions. The most immediate of these is environmental enteric dysfunction (EED), systemic infection and inflammation. EED is a subclinical often asymptomatic disease of the small intestine which alters gut structure due to chronic pathogen contact and ingestion, restricting the body's ability to absorb and use nutrients through the small intestine. Along with chronic nutritional deficiencies, EED and related inflammation impairs immune function, causes neural damage and consequent cognitive impairment.

The pathways through which pathogen contact and ingestion lead to EED and immune impairment start with inadequate sanitation provision. This allows fecal–oral pathogen transmission to occur through the consumption of infected fluids, food, and soil. and is reinforced by adverse hygiene behaviors like feeding a child without washing hands, the disposal of child feces in open waste piles, poor food storage and reheating and exposure of infants to animal waste. Infants are particularly susceptible because their immune systems are underdeveloped and geophagy, the practice of eating soil, is common infant behavior, increasing the likelihood of protozoan ingestion particularly where children are exposed to animal feces.

The environment that exposes a child to EED and chronic infection and inflammation is endemic across Pakistan. There has been virtually no public investment in sanitation, particularly in rural areas. There has been a massive decline in open defecation, from 29 percent to under 12 percent between 2001 and 2018, but this occurred almost entirely through household investment in low quality toilets from which untreated fecal waste is emptied into open drains that run through narrow streets in rural villages and urban low-income neighborhoods. There has also been no investment in the provision of safe drinking water.

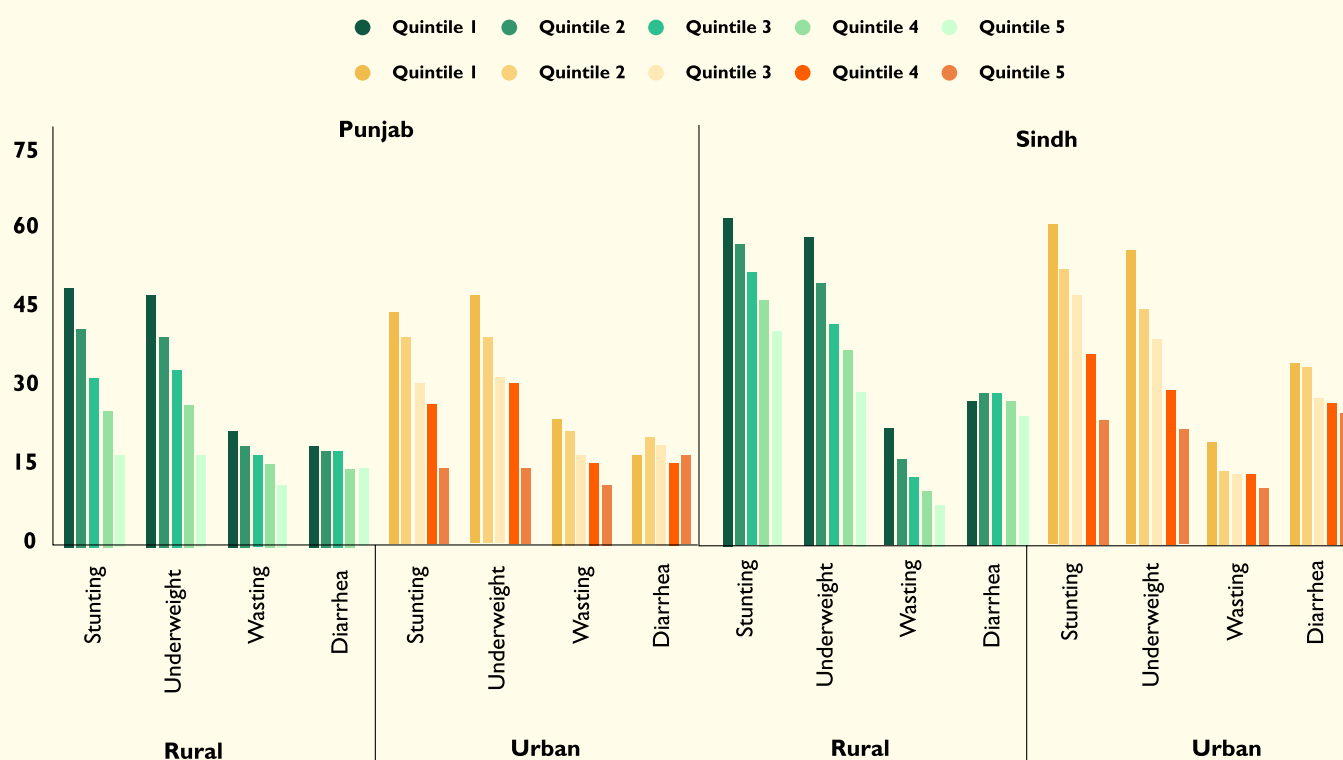
⁴ See Wellesley L et al. The business case for investment in nutrition. Chatham House, The Royal Institute of International Affairs, 2020.

⁵ The national Nashonuma program is a case in point.

Water testing results show that at least a third, and in some provinces like Sindh, up to one-half, of drinking water is bacterially contaminated at its source (at the tap, handpump etc.) and the rate of bacterial contamination nearly doubles when water is tested at its point of use, usually a storage container, indicating the important additive role of poor hygiene behaviors.⁶ Animal exposure is also common, particularly in rural areas where food animals routinely live in close proximity to humans, and infants are readily exposed to animal waste through crawling and mouthing behaviors as well as through the mother’s hands.⁷ Exposure of infants to nitrates in drinking water, through excessive use of chemical fertilizers, and to aflatoxin in stored grains used to prepare key complementary infant food has further exacerbated environmental conditions.

The wide ranging impact of environmental contamination and rapid population rise are also evident in the levels of diarrhea and stunting prevalent in the wealthiest urban areas of the country. Income and urban location provide far less protection in Pakistan than in many other countries, with levels of stunting and the prevalence of diarrhea remaining surprisingly high even among the highest income quintiles and very little difference between urban and rural areas (see Figure 2).

Figure 2: Stunting, Underweight, Wasting, and Diarrhea in Children Under Five by Income Levels Punjab & Sindh, Rural-Urban and Expenditure Quintiles, 2014)



Source: Mansuri et al. (2018) ,Figure 3.6. ibid, footnote 6.

Sustained and broad-based behavior change is necessary to ensure that all pathways through which infants are exposed to pathogens are closed. The set of interventions related to hygiene, health, child feeding and care practices, and the prevention of infant contact with animal feces is now labeled babyWASH.⁸

⁶ This evidence is reviewed in detail in: Mansuri et al, 2018. “When Water Becomes a Hazard: A Diagnostic Report on the State of Water Supply, Sanitation and Poverty in Pakistan and its Impact on Child Stunting.” WASH Poverty Diagnostic Report, World Bank Group, Washington, DC.

⁷ Research has shown up to 5 pathogens in the small intestines of exclusively breast-fed babies.

⁸ Waller et al, 2020, Multiple and complex links between babyWASH and stunting: an evidence synthesis, Journal of Water, Sanitation and Hygiene for Development.

Neglect of the environmental drivers of child stunting significantly constrains the efficacy of critical nutrition specific interventions. Nutritional and cash transfer interventions generally produce weak impacts on child stunting even where there is considerable success in reducing diarrhea and diarrhea induced mortality. The underlying mechanism for this is now understood to be impaired gut health and inability to absorb nutrients. This can also help explain why there has been virtually no reduction in child stunting, over the past two decades, despite a sharp decline in monetary poverty.⁹

Pakistan's exceptionally high fertility rate is an important driver of the intergenerational transmission of child stunting.

The total fertility rate in Pakistan is still at 3.3, while the rest of the region is already at or below replacement fertility levels. There is no dearth of evidence that children born to young mothers and higher birth order children are more likely to be stunted. There is also growing evidence that stunting can begin in utero with birth length highly predictive of length at age 2. Stunting in utero is characterized by high levels of inflammatory markers like CRP and low Insulin like growth factor-I (IGF-I) levels and is also associated with low maternal IGF-I levels at birth. This points to the critical importance of pre-conception maternal health, and attention to the health and nutritional status of young women more generally, including their exposure to EED, chronic inflammation or infection. A decline in overall fertility and delayed motherhood are essential for this. Many studies have shown that a decline in fertility is accompanied by an increase in the educational attainment of girls and increased participation by women in income-generating activities, with beneficial impacts on household income and investments in children's education and health and improvements in gender equity.

Sustained progress on child stunting and on human capital more broadly is now also at significant risk from repeated extreme weather events due to climate change and environmental degradation.

The combined impact of climate change and environmental degradation is already compromising food and water security. This will make it difficult to sustain progress on child stunting unless early action is taken to safeguard the agri-food system by a shift towards more sustainable and regenerative practices. Pakistan is among the countries at the highest risk for climate change related extreme weather events that are projected to intensify heat waves, change monsoon and rainfall patterns, and accelerate glacial melt. It is also among the countries that face the largest threats to natural capital and biodiversity loss due to environmental degradation. Modeling done for the Pakistan Country Climate and Development Report 2022¹⁰ found that even a very partial assessment of potential damages from extreme weather events could reduce GDP by 10-15 percent by 2050 and bring poverty reduction to a virtual standstill. A fuller assessment that includes damages to critical health, water, sanitation, and education services and infrastructure would intensify these impacts and make progress on child stunting much harder to sustain.

⁹ Using the national poverty line, monetary poverty fell from 64 percent to under 25 percent. Using global poverty monitoring metrics, extreme poverty, measured as US\$1.90 or less per person per day, was virtually eliminated over this period, decreasing from 28.2 percent to about 3 percent. Over the same period, poverty at the lower middle-income line of US\$3.20 per person per day also declined from 73.5 percent to 34.3 percent by 2018.

¹⁰ World Bank. 2022. Pakistan Country Climate and Development Report. Washington, DC. <http://hdl.handle.net/10986/38277>



Recommendations

Synergistic multi-sectoral action will be required to shift the current equilibrium, combined with comprehensive and sustained behavior change communication at all levels.

This is not a trivial ask and it cannot be the exclusive responsibility of any single government department or ministry. It is important therefore to address both the theory of change and the potential implementation challenges upfront.

Recommendation #1 – Adopt a revised theory of change that includes all the critical drivers of stunting and put it through an intensive process of socialization within government. Expand the set of interventions from the more familiar actions referred to as ‘nutrition specific’ in frameworks like the 2021 Lancet Maternal and Child Nutrition Framework,¹¹ to include the critical environmental factors that drive a large part of the biological process underlying stunting. These include, in particular, access to safe water and sanitation and the safe management of animal and solid waste, to reduce EED. The 2021 Lancet update on Maternal and Child Undernutrition¹² acknowledges this by noting that “New evidence on the causes of poor growth points towards subclinical inflammation and environmental enteric dysfunction.” It will also require urgent attention on reducing fertility and safeguarding food and water security and dietary quality and diversity, through a shift to a more sustainable and climate resilient food system, which can also reduce infant exposure to nitrates in drinking water and aflatoxin in prepared infant foods. Additionally, attention to early childhood education will be needed to moderate cognition losses to protect the generations of young children who are, or soon will be, past the age where reversal is feasible. The labeling of interventions, such as in the Lancet framework, has led to an unintended hierarchization in which dietary and nutrition related interventions, labeled ‘nutrition specific’, have become the near exclusive focus of most efforts to reduce stunting. This needs to end. Finally, it will require much greater focus on sustained and comprehensive community and household behavior change.

Recommendation #2 – Operationalize and adequately empower federal and provincial bodies charged with addressing child stunting. To enable these bodies to deliver at the necessary quality and scale, the following will be needed:

- **Strong political and administrative backing at the highest levels of government with a clear mandate to assign sectoral responsibilities** with well-defined metrics of success, and time-bound and measurable outcomes.
- **An implementation plan** that lays out precisely what needs to be done, who is responsible, and the resources allocated to support each targeted outcome. To enable this, the assignment of decision-making powers will need to be commensurate with responsibility, especially for implementation-level bodies, and technical and operational capacity will need to be built in all relevant sectors.
- **A transparent and public system for tracking resource flows and outcomes.** Available finance data does not allow for a credible tracking of resource flows and is entirely unlinked to any results framework. For a high-level focus on stunting to be actionable, much better resource flow data will be needed, which is tagged to specific actions and outcomes, and is at the level of detail needed for monitoring against agreed results.
- **A monitoring and evaluation system to enable third party verification** of implementation quality and achievement of agreed targets and outcomes.

¹¹ Emily et al. 2021. Effective interventions to address maternal and child malnutrition: an update of the evidence. *Lancet Child Adolesc.*

¹² Cesar et al. 2021. Revisiting maternal and child undernutrition in low-income and middle-income countries: variable progress towards an unfinished agenda. *Lancet* Volume 397. [https://doi.org/10.1016/S0140-6736\(21\)00394-9](https://doi.org/10.1016/S0140-6736(21)00394-9)

Recommendation #3 – Focus sharply on areas and populations that are most deprived and move towards geographical and sectoral convergence at scale. A multi-sectoral synergistic approach will require the geographic convergence of interventions in WASH, nutrition, population and health, social protection, agriculture, and early childhood education, and these interventions will need to be done at sufficient scale to interrupt the cycle of deprivation that leads to stunting. A convergence approach has been very successful in countries that are achieving a sustained and accelerated reduction in child stunting. Given both resource and capacity constraints, areas with the worst stunting levels will need to be prioritized for action.

Recommendation #4 – Implement a sustained, high visibility nationwide behavior change campaign, aligned with the revised theory of change, to create mass public awareness. The campaign will need to highlight the enormous costs of child stunting, its key drivers, the actions that government is taking, and the actions that households and communities need to take to protect infants, young children, and mothers. This will require a reach out through all channels of communication (television, radio, billboards/posters as well as print and social media platforms and push messaging to mobile phones etc.), with content designed for audiences with varying levels of literacy and customized for rural and urban contexts. It will also need the active participation of NGOs and CSOs to mainstream messages and support behavior change at the grass roots level.

Recommendation #5 – Address the following critical implementation bottlenecks

- **There is no department at the provincial level with a clear mandate for the delivery of safe water and sanitation or waste management in rural areas.** While specific solutions may vary by province, two things are clear. The responsibility for rural and urban water and sanitation services should not reside in one entity and the delivery of such services will remain unsustainable without a shift to a utility model, where a publicly owned utility (or a utility with a public private partnership) has a clear mandate and responsibility to provide safe water, sanitation, and waste management services against a sustainable tariff.¹³ Given the cost of providing services in rural and remote areas with small scattered settlements, innovative solutions for the provision of safe water and sanitation will also be needed.
- **The implementation of nutrition interventions that have been included in the Universal Health Coverage Benefit Package (UHC-BP) needs strengthening.**¹⁴ There is a severe shortage of knowledgeable, skilled, and motivated health personnel in the primary health system, as well as a lack of nutrition related training and essential medicines and specialized nutrition commodities. Pakistan has a 1.45 ratio of health professionals (physicians, nurses, midwives and LHWs) per 1,000 people, just one-third of the health workforce goal of 4.45. Shortages of qualified personnel are even more acute in Balochistan and Sindh, which have the highest rates of stunting, and things are far worse in rural areas, due to absenteeism, low staff retention, weak support mechanisms and poor-quality and ill-coordinated supervision. The availability of essential medicines, particularly specialized nutrition commodities, and other supplies at PHC facilities also remains a key impediment to delivering health and nutrition care of adequate quality at sufficient scale. The situation is considerably worse in rural and hard-to-reach areas. This will need to be remedied through capacity building, the hiring of qualified staff, and the adequate stocking of medical supplies and nutritional commodities. A transparent resource tracking system will be invaluable for this.

¹³ Such utilities have been successfully set up in many countries, including in neighboring countries like India. In Pakistan, the government of Punjab has taken the first step in this direction by setting up the Punjab Rural Municipal Services Company (PRMSC) along the same lines.

¹⁴ UHC-BP, also called the Essential Package of Health Services (EPHS), is to be implemented through the District First Level Hospitals and Primary Healthcare Centers (i.e., Basic Health Units and Rural Health Centers) and Lady Health Workers in accordance with the Health Sector National Action Plan (2019-2023).

- **Action on family planning in Pakistan has been constrained by both a lack of leadership and hesitance around highlighting the critical need for family planning due to religious concerns.** Lack of coordination between the Population Welfare Department and the Department of Health has worsened this problem, as has the dilution of LHWs focus on family planning due to the addition of other health related tasks after 2000. Changing this will require an intense process of communication at all levels to affect a mindset shift, the provision of adequate and easy access to all forms of birth control and support for family planning through the primary health care system. This has been successfully achieved across the region over the very recent past, providing many useful lessons for Pakistan.

ABOUT THE “REFORMS FOR A BRIGHTER FUTURE” DISCUSSION NOTES:

“Reforms for a Brighter Future” is an initiative of the World Bank, aimed at fostering debate and dialogue on critical economic development policy issues facing Pakistan. Further information is available from the World Bank Pakistan website at <https://www.worldbank.org/en/country/pakistan/brief/reforms-for-a-brighter-future-time-to-decide>. This is the first of a series of eight discussion notes. These notes outline World Bank recommendations across selected policy areas where major reforms are critical for Pakistan’s progress towards inclusive and sustainable development. They do not aim to be comprehensive, but rather focus on selected areas where major policy shifts will be required to improve Pakistan’s current development trajectory. Feedback from consultations and dialogue will be incorporated as the notes are finalized. This note was prepared by Ghazala Mansuri (Lead Economist) and Ziauddin Hyder (Senior Health Specialist). Please send feedback or comments to Tobias Haque (Task-Team Leader, thaque2@worldbank.org) and Puteri Watson (Task-Team Leader, pwatson2@worldbank.org).