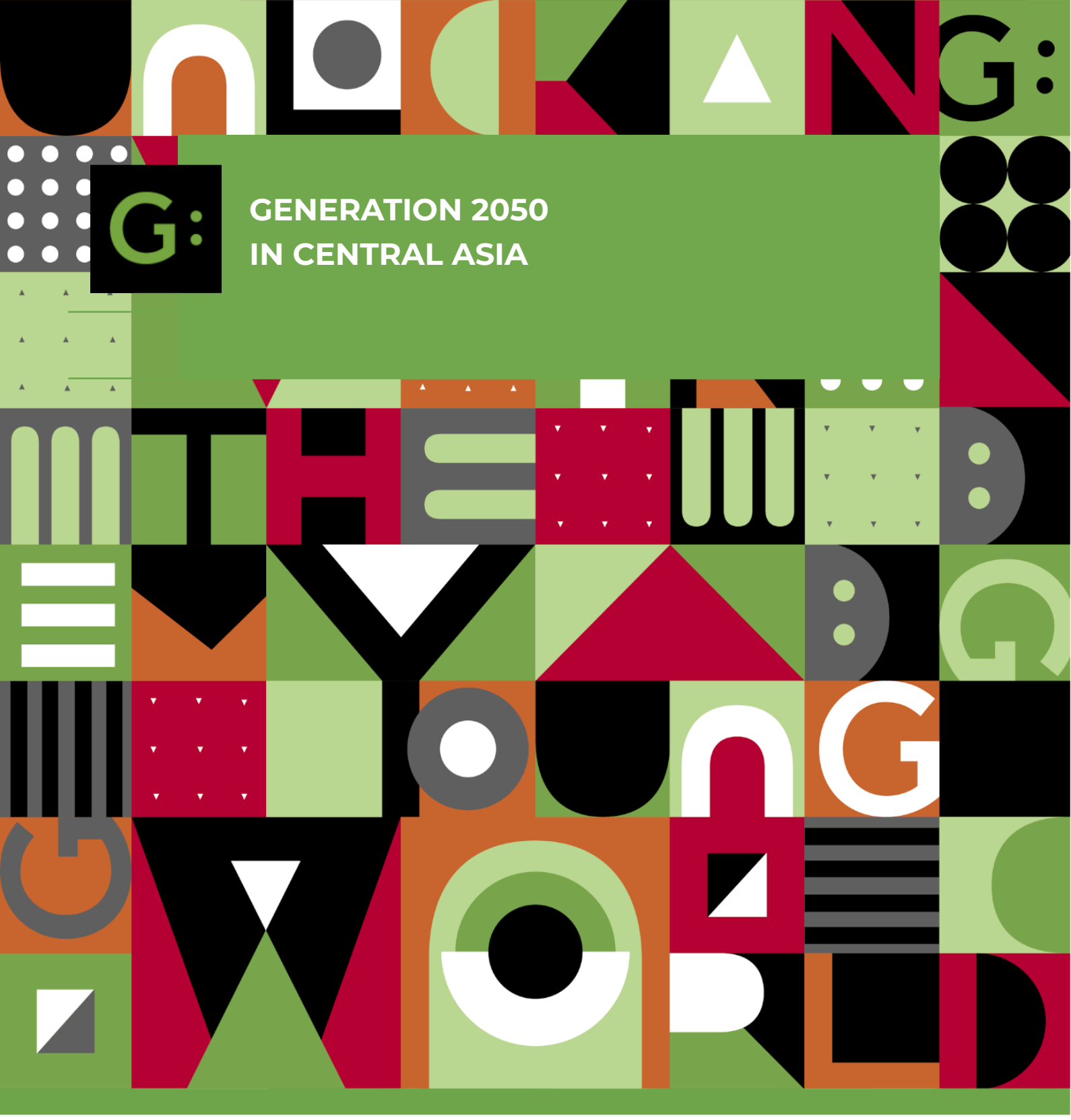

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Abbreviations

Abbrev.	Meaning
ALMPs	Active Labour Market Policies
ASP	Adaptive Social Protection
CDB	Child Disability Benefits
CLTS	Community-Led Total Sanitation
CPSS	Child Protection Systems Strengthening
CPiE	Child Protection in Emergencies
CRC	Convention on the Rights of the Child
EMIS	Education Management Information Systems
GBAO	Gorno-Badakhshan Autonomous Region
HCI	Human Capital Index
ILO	International Labour Organization
LAC	Latin America and the Caribbean
MB	Maternity Benefits
MPL	Minimum Proficiency Level
NPISHs	Non-Profit Institutions Serving Households
ORS	Oral Rehydration Solution
PPPs	Public–private Partnerships
SDGs	Sustainable Development Goals
SPSR	Social Protection Single Registry
UCB	Universal Child Benefits
WaSH	Water, Sanitation, and Hygiene

1. Introduction

Growing evidence suggests that investing in the human capital of children and young people contributes to sustained economic growth and political stability. Whilst it is often seen as a cost, investing in the human capital of children and youth should instead be seen as a public investment, since it generates returns to society through higher economic growth.[1] It also avoids social costs associated with negative conduct and low social capital accumulation, which impose both direct and indirect costs on societies in future.[2] Furthermore, human capital development investments are cumulative, since investments made early in a person's life have more time to materialise.[3]

The Central Asian region[4] has a unique opportunity to harness a "demographic dividend". Over 50% of the population is under the age of 30.[5] In the next two decades, this cohort will form the largest labour force the region has ever seen, both in terms of absolutely numbers as well as the percentage of the population that is of working age. This presents an opportunity for a demographic dividend, where a higher ratio of working-age individuals to dependents can lead to increased disposable income, fueling consumption, production, investment, and accelerated economic growth. However, realising these benefits requires deliberate action and strategic investments, as the demographic dividend is not automatic.

Central Asian countries risk missing the opportunity for accelerated economic growth, due to underdeveloped human capital. The World Bank's Human Capital Index measures a country's expected productivity of its next generation of workers, based on their health and education outcomes. This index ranges from 0.6 for Kazakhstan, Uzbekistan, and the Kyrgyz Republic to 0.5 for Tajikistan. This means means that children born in Central Asia today will be only 50-60% as productive when they grow up as they would be if they had access to complete education and full health.[6] Furthermore, underinvestment in areas such as child protection, social protection, water and sanitation, and active labour market measures also contributes to lower human capital in Central Asia. The right human capital investments could significantly increase the region's human capital, ensuring the region capitalises on its demographic advantages.

Within this context, this study quantifies future demographic challenges and proposes actionable policy and investment strategies to ensure the demographic dividend is achieved. This study will include a comprehensive analysis of demographic projections for children, adolescents, and youth in the five Central Asian countries over the next 25 years (2025-2050). It will also determine the level of investment needed to leverage the demographic potential of the region via investments in core services for children.

[1] Becker, G. S. (1993), Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education.
[2] Bird, K. (2007), The intergenerational transmission of poverty: An overview
[3] Hempel, K. and Cunningham, W. (2010), Investing in your country's children and youth today: good policy, smart economics.
[4] Central Asia refers to the subregion comprising five countries — Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan.
[5] UNFPA (2024) World Population Prospects.
[6] World Bank (2020) Human Capital Index. Available here.

1.1. Scope and structure of the report

This interim regional report serves as the overarching report for the study. It outlines the demographics of Central Asia, highlights the potential of a demographic dividend in the region, demonstrates the role of human capital investments in achieving this demographic dividend, and proposes a specific portfolio of investments that would be needed to achieve this.

The scope of this report is defined by the following parameters:

- **Geographic Focus:** The analysis covers the five countries that constitute the Central Asian region: Kazakhstan, the Kyrgyz Republic, Tajikistan, Turkmenistan, and Uzbekistan.
- **Demographic Focus:** The report concentrates on children, adolescents, and youth, defined as individuals aged 0-24 years old.
- **Sectoral Focus:** The analysis centers on investments in human capital, with a particular focus on core services that are critical for child well-being and positive outcomes in adulthood. These sectors include health and nutrition, education, child protection, social protection, water and sanitation (WASH), and active labour market policies.
- **Temporal Focus:** The report utilizes demographic projections extending to the year 2050, providing a 25-year outlook on the trends and challenges facing the region's youth.

The structure of this report is as follows. It will begin with a detailed analysis of the demographic landscape of Central Asia, followed by an examination of the potential for a demographic dividend. Subsequently, it will present an investment portfolio outlining key interventions in the priority sectors required to build human capital and achieve this dividend.

This report does not include several important components. It does not include country-specific policy recommendations. Whilst it includes an overview of the total costs and financing options for each of the five countries, it does not include a comprehensive costing of the interventions proposed or fiscal space analysis. Both of these aspects are included in the country-specific annexes which have been submitted alongside this report.

2. Demographics of Central Asia

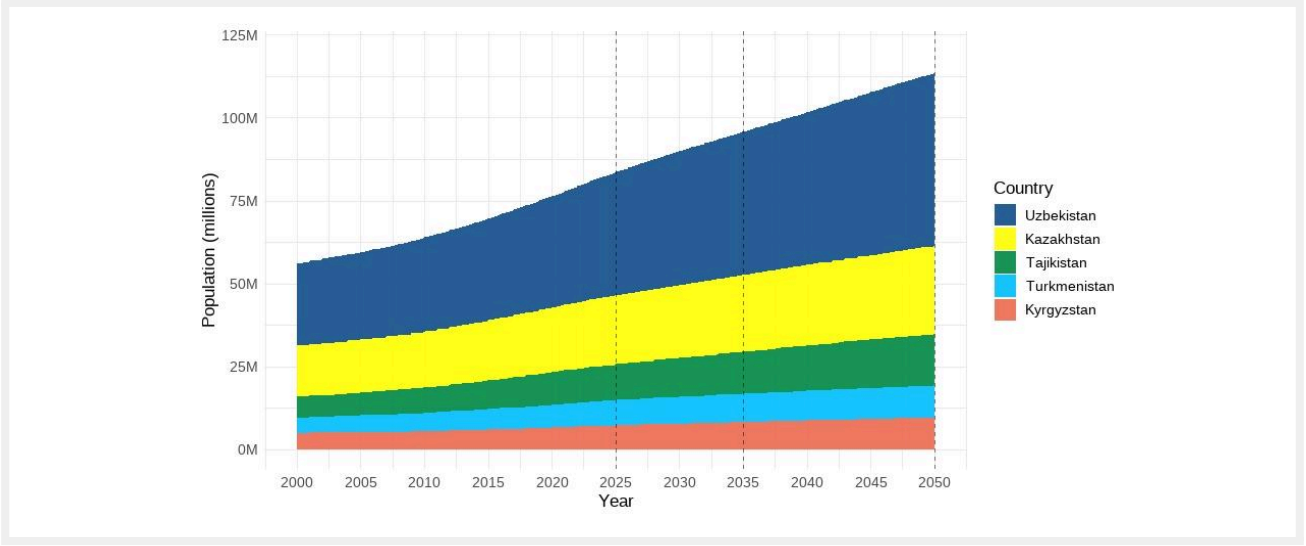
The demographic landscape of children and youth in Central Asia is undergoing significant changes, shaped by evolving fertility rates, migration patterns, climatic, and socio-economic factors. This section explores these demographic trends and their implications for the region's future, focusing on the needs and potential of the younger population.

2.1. Total Population

Central Asia is a diverse subregion comprising five countries — Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan — each with distinct demographic and socio-economic characteristics shaped by their post-Soviet legacies and current development pathways. These countries differ markedly in fertility levels, age structures, and economic capacity. Tajikistan and Kyrgyzstan continue to exhibit high fertility and a youthful demographic profile, while Kazakhstan and Uzbekistan show signs of demographic maturity, with declining fertility and a gradually ageing population. Turkmenistan lies somewhere in between, reflecting both youthful and maturing characteristics.

Despite slowing growth rates, Central Asia's population will grow steadily through the first half of the twenty-first century.[7] As of 2025, the combined population of these five countries will exceed 84 million, with Uzbekistan (37.1 million) and Kazakhstan (20.8 million) accounting for the largest shares *(see Figure 1)*.[8] In 2000, the region's combined population stood at 56.2 million, representing just under 1 per cent of the world total. Since then, it has grown at an average annual rate of 1.6 per cent—higher than the global average of 1.2 per cent. Growth continues, albeit more gradually, with the rate projected to decline to 1.1 per cent by 2030 and 0.7 per cent by 2050. Still, the region's total population is expected to nearly double between 2000 and 2050—from 56.2 million to approximately 111.7 million.[9]

Figure 1. Population Composition in Central Asia (2000–2050)



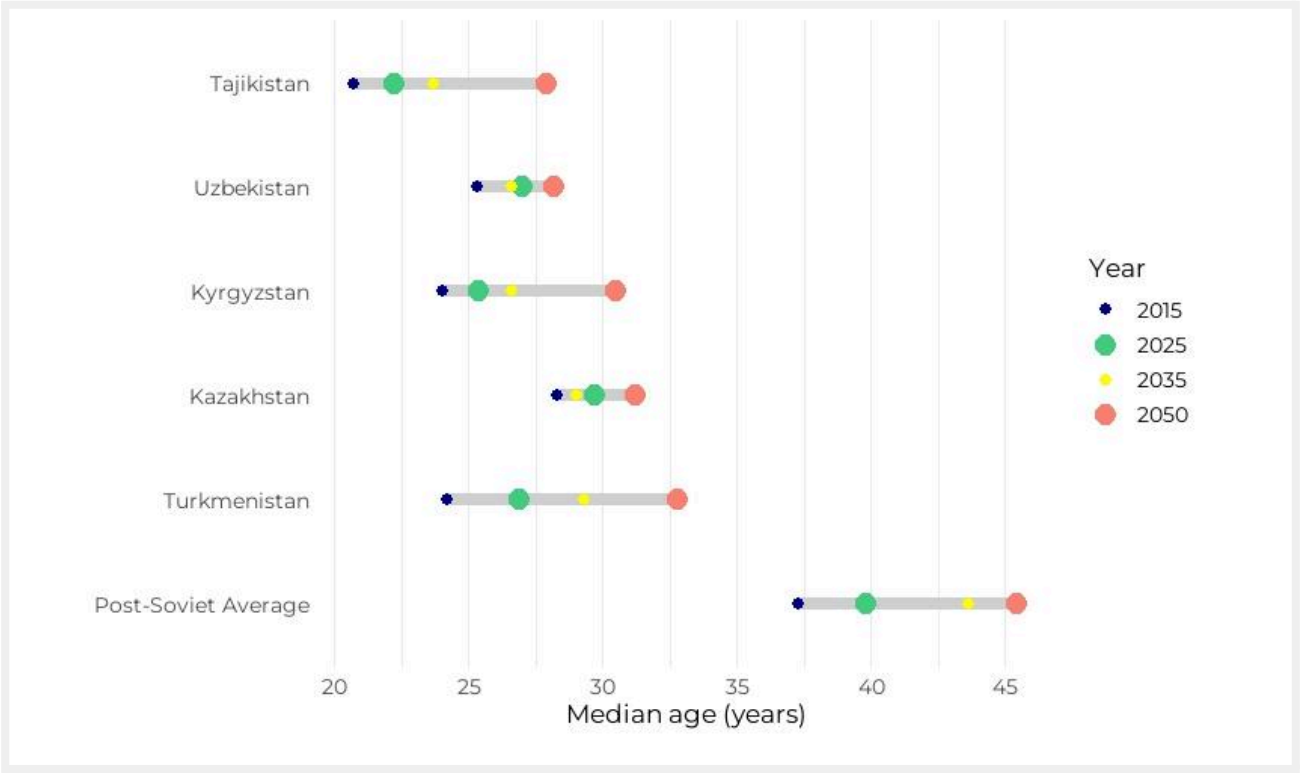
Source: *United Nations, Department of Economic and Social Affairs, Population Division, World Population Prospects: The 2024 Revision (UN WPP), United Nations, New York, 2024.* ***Note:*** *Countries are arranged highest to lowest population in 2025.*

[7] Ibid
[8] All analysis in this section is based on the United Nations Department of Economic and Social Affairs, Population Division, 2024. World Population Prospects: The 2024 Revision. Projections are using the medium fertility variant.
[9] Ibid

Demographic expansion brings with it both opportunities and challenges. Between 2000 and 2015 alone, Central Asia added more than 13 million people, and a similar increase is projected between 2015 and 2035. To harness the benefits of this growth—particularly in terms of the large youth population—governments must scale up investments in human capital. With the right policy choices, this demographic momentum could translate into lasting social and economic dividends.[10]

The population remains youthful, particularly in Tajikistan, Kyrgyzstan, and Uzbekistan, where children and young people under 25 years make up nearly half of the population. Median age data further reflect this opportunity: Tajikistan (22.2), Kyrgyzstan (25.4), and Uzbekistan (27.0) remain among the youngest populations in the post-Soviet region[11] (Figure 2). Even by 2050, the median age in these countries will remain below 30, underlining the prolonged duration of the demographic dividend. Kazakhstan, meanwhile, is ageing more rapidly—with a median age of 29.7 years in 2025, expected to rise to 31.2 by 2050. These trends signal a narrowing opportunity for demographic dividends in Kazakhstan while offering a longer window for countries like Tajikistan and Kyrgyzstan—provided that adequate policies are in place to harness the productive potential of their youth.[12]

Figure 2. Median age change, 2015–2050



Source: *United Nations, Department of Economic and Social Affairs, Population Division, World Population Prospects: The 2024 Revision (UN WPP), United Nations, New York, 2024.* ***Note:*** *Countries are ranked from highest to lowest median age in 2025. Post-Soviet Average excludes the five Central Asian countries.*

Population growth will be widespread across Central Asia, driven by natural increase. Population growth remains a defining trend in Central Asia, with all five countries projected to experience continued expansion through 2050. Natural increase primarily drives this growth, with births

[10] Gietel-Basten, S. and Snow, R. (2025). Capitalizing on Population Dynamics 30 Years on from the International Conference on Population and Development. Studies in Family Planning, 56: 177-197. Available here.

[11] The 15 post-Soviet countries are sovereign states that emerged after the Soviet Union's dissolution in 1991: Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan. They are also referred to as former Soviet republics or Former Soviet Union (FSU) countries.

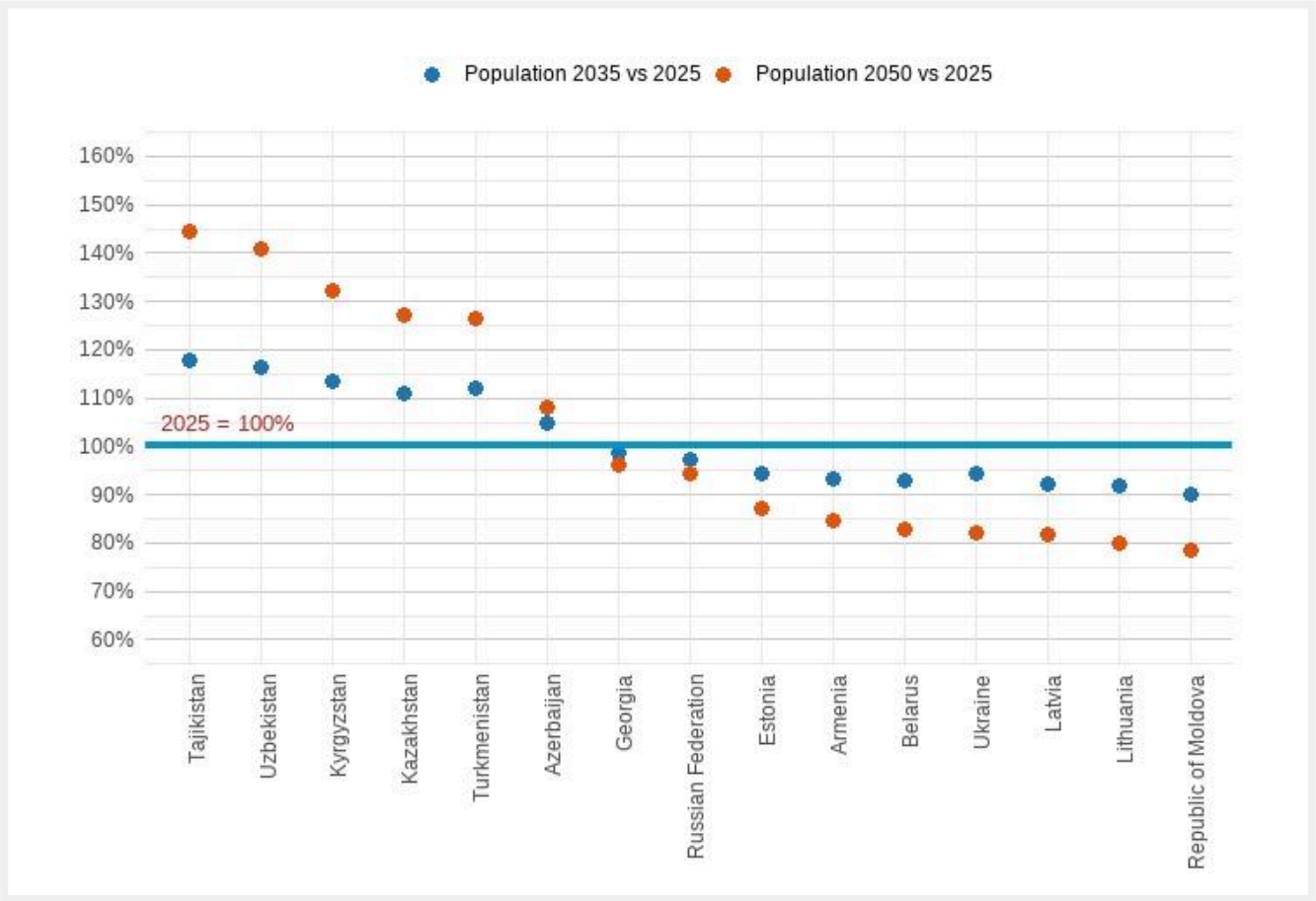
[12] United Nations, Economic and Social Commission for Asia and the Pacific (ESCAP) (2023). Asia-Pacific Population and Development Report 2023 (ST/ESCAP/3112)

surpassing deaths as fertility rates stay above replacement level in Tajikistan, Uzbekistan, and Kyrgyzstan. Migration has a modest role in shaping these dynamics across much of the region.

Tajikistan is set to undergo the fastest demographic expansion. Its population, currently around 10.8 million (2025), is projected to surpass 15.6 million by mid-century—an increase of over 45 per cent. Uzbekistan, already the most populous country in the region, is expected to add more than 15 million people, reflecting nearly 40 per cent growth. Kyrgyzstan and Turkmenistan will each grow by around one-third, while Kazakhstan is expected to see a 27 per cent increase.

Central Asia's growth is among the most robust in the broader region. As shown in the figure, these gains contrast with the declining population trends in many Eastern European and Baltic countries. Ukraine, Belarus, Lithuania, Latvia, and the Republic of Moldova are projected to lose 20 to 30 per cent of their populations by 2050 compared to 2025 levels. The Russian Federation will also experience population decline, though at a slower pace.

Figure 3. Changes in total population from 2025 to 2035 and 2050



Source: *UNICEF analysis based on United Nations, Department of Economic and Social Affairs, Population Division, World Population Prospects: 2024 Revision (Medium fertility variant).*

Between 2000 and 2050, Uzbekistan's population is projected to more than double—from 24.8 million to 52.2 million. Kazakhstan will grow from 15.5 million to 26.5 million, and Tajikistan from 6.3 million to 15.6 million. Kyrgyzstan and Turkmenistan will also see significant increases, reaching around 9.6 million and 9.6 million, respectively, by 2050 *(see Figure 1)*.

These countries will account for a significant portion of population growth across the broader Eurasia region.

From 2025 to 2050, the five Central Asian countries alone will add over **30 million** people[13]. In absolute terms:

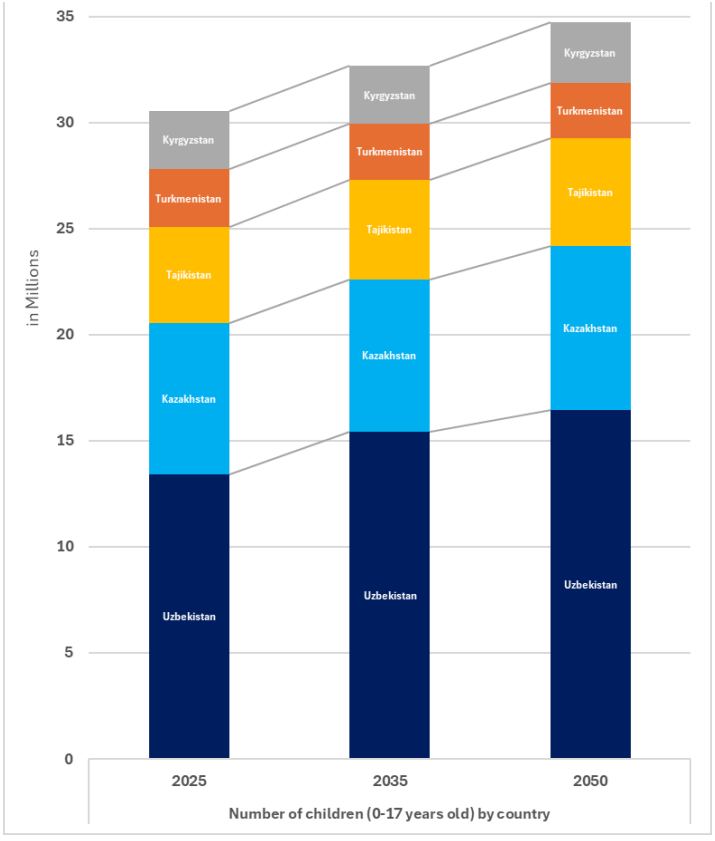
- **Uzbekistan** will add the largest number—over **15 million**,
- **Kazakhstan** will add around **5.7 million**,
- **Tajikistan** nearly **4.8 million**,
- **Kyrgyzstan 2.3 million**,
- and **Turkmenistan** over **2 million**.

2.2. Children and Youth

Children and young people aged 0–24 form a significant share of the population in Central Asia—particularly in Tajikistan, Kyrgyzstan, and Uzbekistan—where they account for nearly half the total population.

As *Figure 4* shows, Uzbekistan alone is projected to have over 15 million children (0–17 years) by 2035, while Tajikistan will see its child population continue to rise through mid-century. The adolescent (10–19 years) and youth (15–24 years) populations also remain strong in these countries, sustaining momentum for a demographic dividend.

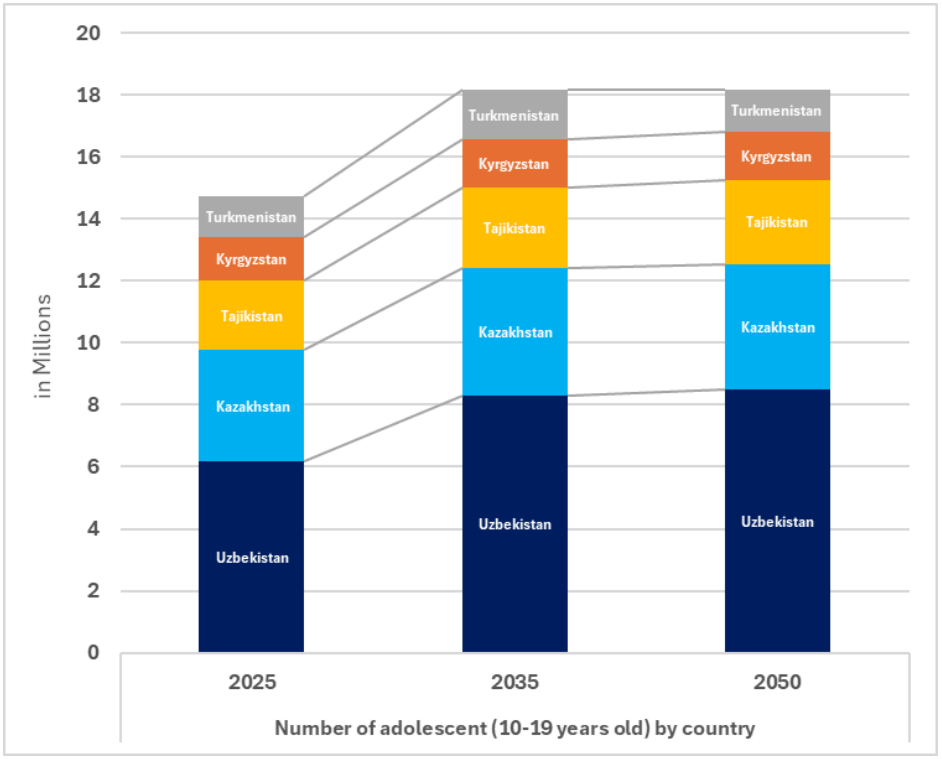
Figure 4. Number of children (0-17 years) by country, 2025, 2035 and 2050 (in millions)



Source: *UNICEF analysis based on United Nations, Department of Economic and Social Affairs, Population Division, World Population Prospects: 2024 Revision (Medium fertility variant). Note: the countries are arranged highest to lowest in 2025 population*

[13] Please refer annex Table B.

Figure 5. Number of adolescents (10-19 years) by country, 2025, 2035 and 2050 (in millions)

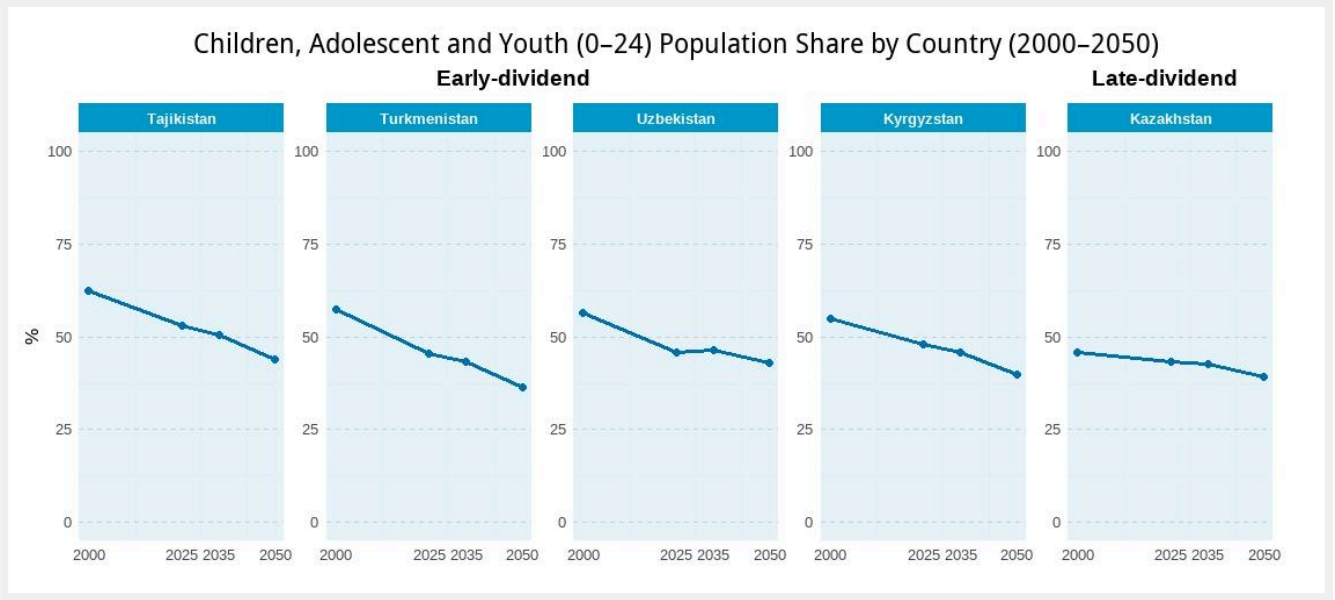


Source: *UNICEF analysis based on United Nations, Department of Economic and Social Affairs, Population Division, World Population Prospects: 2024 Revision (Medium fertility variant). Note: the countries are arranged highest to lowest in 2025 population*

The share of children and youth (0–24 years) in Central Asia is projected to decline significantly by 2050. At the turn of the 21st century, children, adolescents, and youth (aged 0–24 years) comprised over half of the total population in all Central Asian countries—Tajikistan, Turkmenistan, Uzbekistan, Kyrgyzstan and Kazakhstan. This youthful demographic profile reflected high fertility rates and marked the early stages of a potential demographic dividend.

Population projections indicate a consistent and notable decline in the proportion of young people across the region over the coming decades. By 2050, the share of the 0–24 age group will fall below 50 per cent in all five countries. As illustrated in *Figure 5*, the decline will be particularly sharp in countries such as Tajikistan and Turkmenistan, which are expected to see reductions of over 20 percentage points. Uzbekistan and Kyrgyzstan will experience more gradual but steady declines, while Kazakhstan, which began its demographic transition earlier, will see its youth population proportion fall to around 35 per cent by mid-century.

Figure 6. Percentage of total population represented by children, adolescents, and youth (0-24 years), by country, 2000-2050



Source: *UNICEF analysis based on United Nations, Department of Economic and Social Affairs, Population Division, World Population Prospects: The 2024 Revision (UN WPP), United Nations, New York, 2024.*

These trends signal a significant demographic shift, impacting future labour supply, economic growth, and public policy. The shrinking window to harness the demographic dividend calls for urgent investments in young people to build human capital and resilience.[14]

While the proportion of youth declines, absolute numbers will continue to grow or stabilise in some countries until 2035, before declining by mid-century. Although the share of youth in the overall population is declining, the absolute number of young people aged 15 to 24 is projected to increase or stabilise in several Central Asian countries through the mid-2030s. According to *Figure 6*, Uzbekistan is expected to experience the most substantial growth, with youth numbers projected to rise by more than 50 per cent between 2025 and 2035. Tajikistan and Kazakhstan are also likely to see moderate increases over this period.

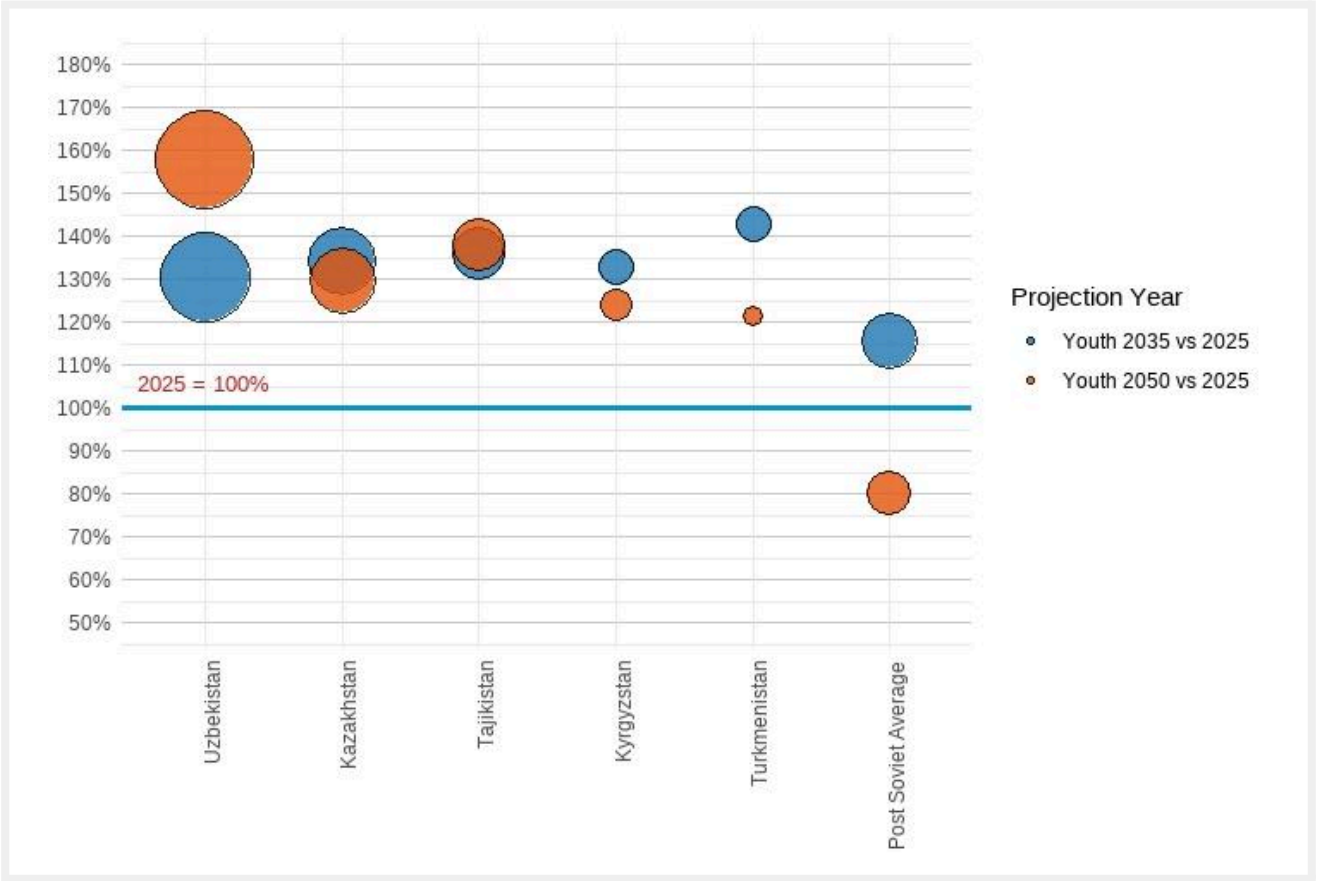
In contrast, Kyrgyzstan and Turkmenistan are expected to maintain relatively stable youth populations before entering a phase of gradual decline. By 2050, however, all five countries are projected to experience a reduction in both the number and proportion of youth. This decline reflects broader trends of decreasing fertility and population ageing.

As shown in *Figure 7*, the demographic trajectories of Central Asian countries vary, but the underlying shift toward an older population is consistent. These developments carry important policy implications which are the subject of this study.[15]

[14] UN Department of Economic and Social Affairs, Division for Policy Analysis and Public Affairs. (2023, July). *Harnessing the economic dividends from demographic change.* United Nations.

[15] UNESCO (2021). Youth of Central Asia, challenges for peacebuilding: A comprehensive research review (L. Yerekesheva, Author). UNESCO Publishing. ISBN: 978-92-3-100497-1. [CC BY-SA 3.0 IGO].

Figure 7. Changes in Youth Population (15-24) from 2025 to 2035 and 2050



Source: *UNICEF analysis based on United Nations, Department of Economic and Social Affairs, Population Division, World Population Prospects: The 2024 Revision (UN WPP), United Nations, New York, 2024.*

2.3. Women of reproductive age and fertility

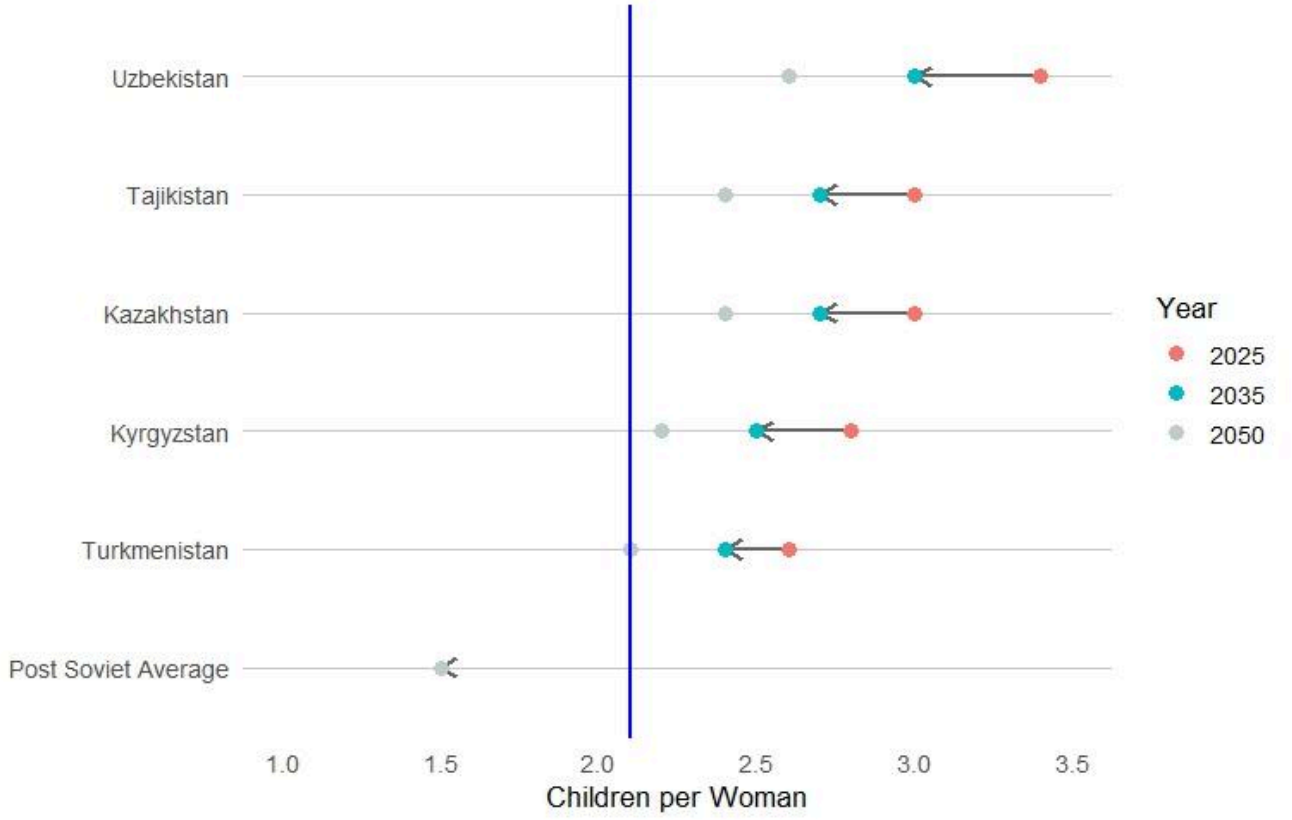
Despite falling fertility rates, the number of births in Central Asia is expected to remain stable until 2050 due to population momentum from a growing base of women of reproductive age. Following the collapse of the Soviet Union, Central Asia experienced a sharp decline in fertility, particularly in Kazakhstan and Kyrgyzstan[16] However, from the early 2000s, most Central Asian countries saw a rebound or stabilisation in fertility rates, diverging from trends in Eastern Europe and the Caucasus.[17]

In 2025, the average total fertility rate (TFR) in Central Asia is among the highest in the post-Soviet region, ranging from 2.7 in Uzbekistan to 3.3 in Tajikistan *(see Figure 7)*. These elevated fertility levels, combined with a youthful age structure, mean the number of women of reproductive age (15–49 years) will continue to rise over the next few decades, even as fertility itself declines gradually.

This demographic mechanism—population momentum—will sustain relatively high numbers of births across Central Asia through mid-century. As a result, the region will likely experience continued population growth, over the next few decades, even as fertility gradually declines toward replacement levels.

[16] Spoorenberg, T. (2017). The Onset of Fertility Transition in Central Asia. Population, 72(3), 473-504. Available here.
[17] Sobotka, Tomáš (2017). Post-Transitional Fertility: Childbearing Postponement and the Shift to Low and Unstable Fertility Levels, Vienna Institute of Demography Working Papers, No. 01/2017, Austrian Academy of Sciences (ÖAW), Vienna Institute of Demography (VID), Vienna. Available here.

Figure 8. Total fertility rate in Central Asian countries (2025, 2035, 2050).



Source: *UN World Population Prospects, 2024 Revision; UNICEF ECARO analysis.*

While fertility levels remain relatively high across Central Asia, a gradual demographic transition is already underway.[18] By 2050, most countries in the subregion are projected to approach or fall slightly below the replacement threshold of 2.1 children per woman. Tajikistan and Uzbekistan are expected to stabilize around 2.1–2.3, while Kazakhstan and Turkmenistan may dip just under replacement level. Kyrgyzstan will likely hover close to the threshold. This makes Central Asian countries an outlier in the Post-Soviet region, and their slower fertility decline presents a unique policy opportunity—one that can deliver a demographic dividend if supported by timely and inclusive investment.[19]

Stable birth volumes across the next two decades, driven by population momentum, mean that pressure on services such as education, health care, childcare, and employment systems will persist.

"The future of Central Asia hinges not only on how fertility changes - but on how governments respond to the needs of the women and girls driving that change." ***Source:*** *UNFPA*

[18] UNFPA (United Nations Population Fund), 2025. "The Real Fertility Crisis: The pursuit of reproductive agency in a changing world." State of World Population 2025. New York: UNFPA. ISBN: 9789211542837

[19] United Nations Population Fund (UNFPA), 2023. Investing in youth: Unlocking the demographic dividend in Central Asia. UNFPA Regional Office for Eastern Europe and Central Asia. Available here.

Without a comprehensive approach to adolescent and maternal health, sexual and reproductive rights, and gender-sensitive social protection, high birth rates risk placing additional strain on public infrastructure and deepening inequality. Addressing this demographic challenge and transforming it into an opportunity is discussed in the following sections.

Table 1. Fertility in Central Asia

Fertility in Central Asia is Declining…
…but the number of births remains stable due to population momentum from a rising number of women of reproductive age.

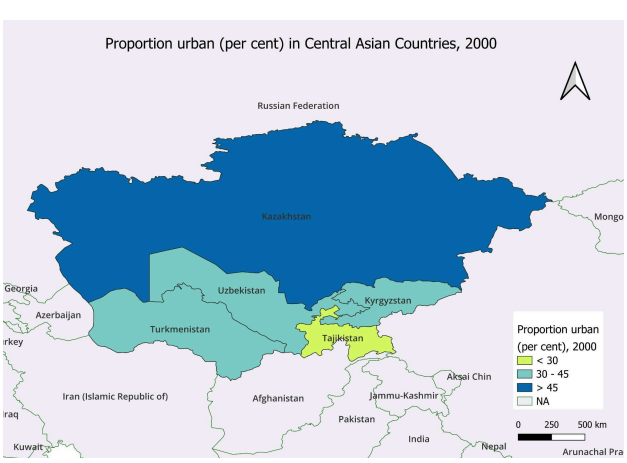
- **2025:** Fertility rates above 2.5 in all five countries
- **2050:** Uzbekistan and Tajikistan near 2.1; others slightly below
- Still over 500 million births projected in the first half of the century

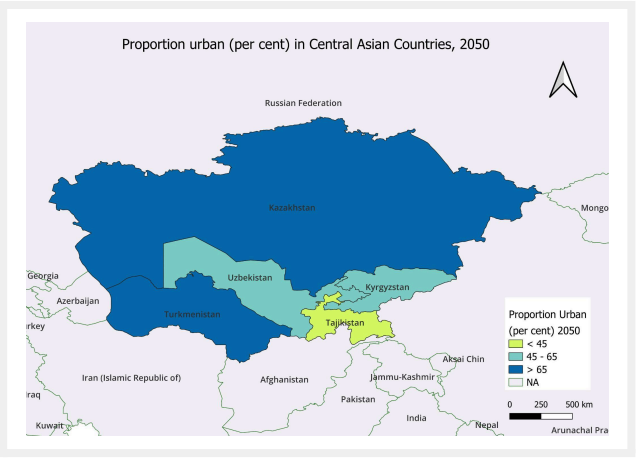
Source: *United Nations, World Population Prospects 2024 (Medium Variant)*

2.4. Urbanisation, migration, and climate vulnerability

Urbanisation is accelerating across Central Asia — but not evenly. Since the early 2000, urbanisation in Central Asia has accelerated steadily, albeit unevenly across countries. In 2000, only 45.7 per cent of the region's population lived in urban areas. By 2020, this had modestly risen to 48.3 per cent, and it is projected to reach 60.5 per cent by 2050[20] *(see Figure 8)*. While Kazakhstan is expected to become most urbanised with 69.1 per cent urban by mid-century, Tajikistan will remain the least urbanised country in the region, with just 43 per cent of its population living in cities by 2050 *(Figure 8)*.

Figure 9 and 10. Urban population, proportion in urban areas



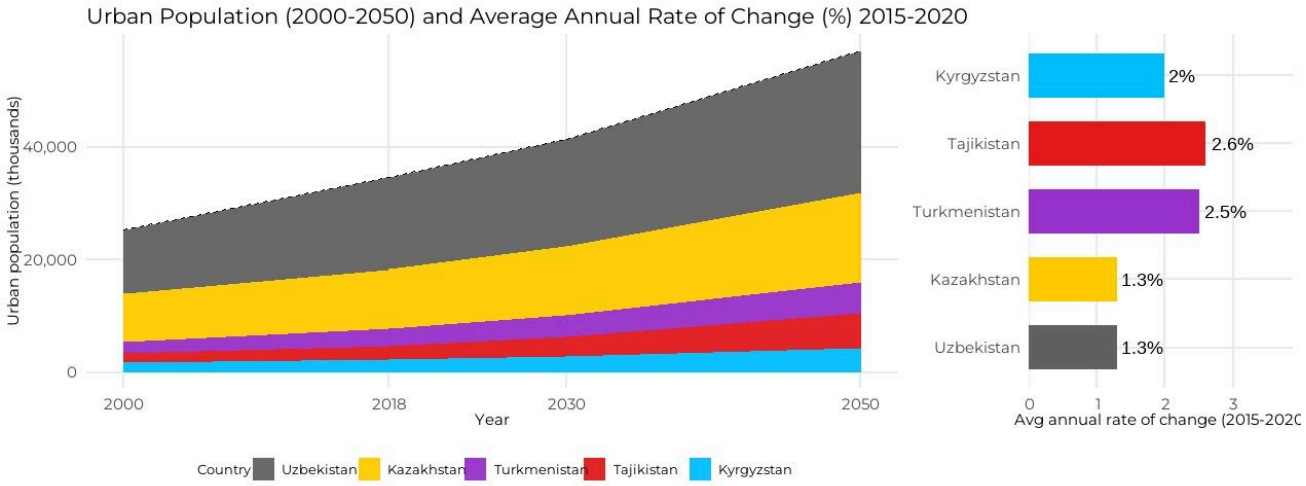


(a)[21]

Source: *United Nations Department of Economic and Social Affairs, Population Division, 2018. World Urbanisation Prospects: The 2018 Revision. United Nations, New York.*

[20] United Nations Department of Economic and Social Affairs, Population Division, 2018. World Urbanisation Prospects: The 2018 Revision. United Nations, New York.
[21] Proportion urban (per cent), 2000 and 2050

Figure 11. Urban population, proportion in urban areas and average annual rate of change



(b)[22]

Source: *United Nations Department of Economic and Social Affairs, Population Division, 2018. World Urbanisation Prospects: The 2018 Revision. United Nations, New York.*

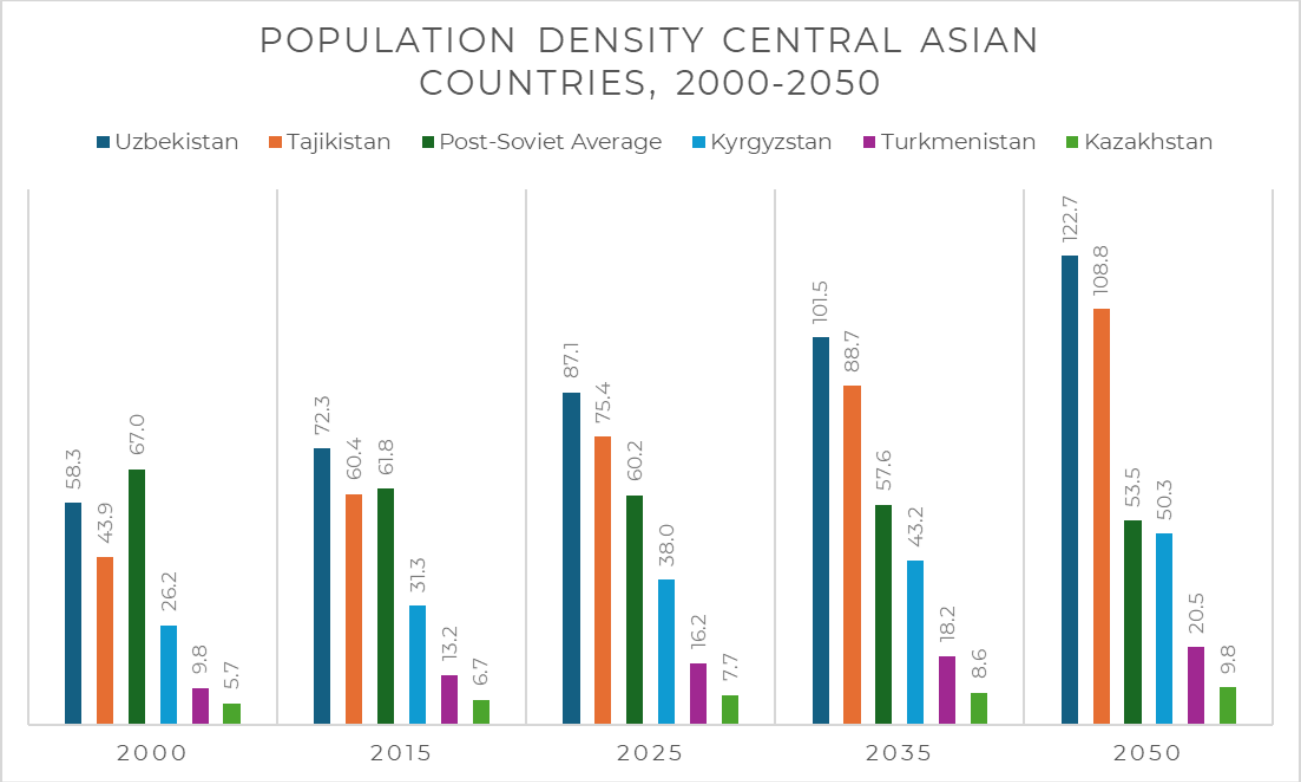
Drivers of urbanisation vary across countries. In Turkmenistan and Uzbekistan, economic restructuring and state-led infrastructure development have contributed to a steady rise in urban shares. Kyrgyzstan and Tajikistan, with their mountainous terrain and dispersed rural populations, have witnessed more moderate urban growth. Underinvestment in rural services continues to generate push factors for migration into cities, especially among young people.

Population density is also increasing rapidly, further intensifying pressure on urban areas. Uzbekistan's density is projected to rise from 72.3 persons per square kilometre in 2015 to 122.7 by 2050, and Tajikistan's from 60.4 to 108.8 over the same period. Kyrgyzstan will see its density grow from 31.3 to 50.3 persons per km^2. In contrast, countries such as Armenia and Georgia are experiencing declining densities due to ageing and emigration—Armenia, for example, is projected to decline from 102.6 in 2015 to 87.7 by 2050[23] *(see Figure 9)*.

[22] Urban population (thousands) in absolute terms over the year 2000-2050 and average annual rate of change (per cent) 2015-2020

[23] Ibid

Figure 12. Population Density Central Asian Countries, 2000-2050



Source: *UN World Population Prospects, 2024 Revision.* ***Note:*** *Countries were arranged based on their ranking, from highest to lowest population density in 2025.*

Migration patterns are shifting — from seasonal flows to semi-permanent displacement. Migration—both internal and international—is reshaping Central Asia's demographic future. Labour migration, particularly from Tajikistan, Kyrgyzstan, and Uzbekistan to Russia and Kazakhstan and to many European countries,, remains central to livelihoods. In Tajikistan, nearly one in six people live abroad, with remittances accounted for approximately 48 percent of GDP in 2024.[24]

However, most migrant workers lack access to portable pensions or long-term social protection abroad. As a result, many return home by late working age, often without contributory benefits[25]. Over the next two decades, countries such as Tajikistan are likely to see a growing cohort of older returnees requiring income support, health care, and community-based social services. Strengthening social protection systems and expanding non-contributory pensions will be essential to ensure inclusive ageing and reduce vulnerability among returning populations[26].

At the same time, migration and remittances—while contributing substantially to national economies—can have unintended social costs. The long-term absence of parents and caregivers often leaves children without consistent emotional and educational support. Evidence from Tajikistan and Kyrgyzstan indicates that children in transnational households may experience greater anxiety,

[24] International Monetary Fund. y the Executive Director for Republic of Tajikistan. IMF Staff Ctry Rep. 2025 July;2025(169):1.

[25] Murakami E, Yamada E, Sioson EP. The impact of migration and remittances on labor supply in Tajikistan. J Asian Econ. 2021 Apr;73:101268.

[26] Asian Development Bank. StrengtSupport for Labor Migration in Tajikistan: Assessment and Recommendations [Internet]. 0 edn. Manila, Philippines: Asian Development Bank; 2020 Dec [cited 2025 Oct 29]. Available from: https://www.adb.org/publications/support-for-labor-migration-tajikistan

lower academic performance, and weaker family cohesion[27]. Prolonged separation can lead to school dropout, reduced parental involvement in learning, and intergenerational vulnerability. Addressing these challenges calls for policies that strengthen child protection, psychosocial support, and community-based services for families affected by migration[28].

Urban centres, especially in Uzbekistan and Kazakhstan, are absorbing growing numbers of internal migrants. These movements, once seasonal and circular, are becoming semi-permanent, leading to the expansion of informal settlements on city outskirts, often with limited access to housing and basic services.

International migration is also shifting. According to the *International Migrant Stock* 2024.[29] Kazakhstan hosts 3.7 million international migrants—more than 19 per cent of its population—while Uzbekistan and Kyrgyzstan are among the region's top countries of origin. Climate-related pressures are increasingly contributing to slow-onset migration from drought-affected and water-stressed areas of Uzbekistan and Turkmenistan into peri-urban zones.

Climate risks are amplifying vulnerabilities of urbanising populations. Central Asia's climate vulnerability is closely interlinked with urbanisation and demographic trends. The region faces accelerated glacier loss, with projections showing 30–50 per cent loss in glacial mass in Kyrgyzstan and Tajikistan by 2050, threatening downstream irrigation and drinking water supply.[30,31]

In agriculturally dependent countries like Tajikistan and southern Uzbekistan, declining water availability and intensifying droughts threaten food security and rural incomes. This pushes migration to urban areas that are often ill-prepared for population surges. In Kazakhstan, the growing urban heat island effect—especially in cities like Almaty and Astana—is expected to disproportionately impact informal sector workers, many of whom are women.[32,33]

According to the ILO's *Working on a Warmer Planet* (2019)[34], climate-induced heat stress is already eroding productivity and GDP across Central Asia. By 2030, total working-hour losses due to heat stress are projected at 0.11 % in Kazakhstan, 0.12 % in Kyrgyzstan, 0.15 % in Tajikistan, 0.22 % in Turkmenistan, and 0.14 % in Uzbekistan—each above the regional average (≈ 0.10 %). Agriculture and construction together account for nearly 80 % of these losses, mirroring global trends where agriculture alone represents 60 % of hours lost. Correspondingly, the projected GDP losses from heat stress reach 0.12 % in Kazakhstan, 0.14 % in Kyrgyzstan, 0.15 % in Tajikistan, 0.19 % in Turkmenistan, and 0.15 % in Uzbekistan—again exceeding the Europe-and-Central-Asia regional average of 0.08 %. These findings suggest that sustaining current levels of economic output will demand stronger, forward-looking investments—in adaptive technologies, resilient infrastructure, and worker protection. Such measures can be politically difficult to champion, as they aim to prevent future losses rather than deliver immediate, visible gains.

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[27] Murakami E. International migration and remittance effects on school enrolment of children staying behind: The evidence from Tajikistan. Int J Educ Dev. 2021 Mar;81:102349.

[28] Akezhuoli H, Tan M, Ma Y, Liu X, Xu J, Lu J, et al. Migrant parent-child separation in the first three years of life and mental health problems at preschool age: A cross-sectional study. J Migr Health. 2025;11:100310

[29] *International Migrant Stock 2024*. UN DESA, January 2025

[30] IPCC Sixth Assessment Report (AR6), Working Group II

[31] Marginean et al., 2024. *High-Resolution Modeling and Projecting Local Dynamics of Differential Vulnerability to Urban Heat Stress*

[32] Adrienne Arsht-Rockefeller Foundation Resilience Center, 2023. *The Scorching Divide*

[33] UN Women Asia-Pacific, 2024. *Strengthening Women's Resilience to Heat Stress in Asia and the Pacific*

[34] Kjellström T, Maître N, Saget C, Otto M, Karimova T. Working on a warmer planet: the effect of heat stress on productivity and decent work. Geneva, Switzerland: International Labour Organization; 2019. 1 p.

Uzbekistan is already facing severe water scarcity, and per capita water availability is expected to drop below 500 m^3 per year by mid-century—well under the threshold for absolute scarcity. This places enormous pressure on growing urban areas such as Tashkent, where rising demand for water and inadequate infrastructure combine to exacerbate climate risks.

Vulnerability is compounded by demographic momentum and infrastructure gaps. Urbanisation and demographic momentum are converging rapidly. The urban population of Central Asia is projected to increase from 34.6 million in 2018 to 57 million by 2050—a 65 per cent increase in just three decades[35] (see Table 4). Much of this growth will occur in Uzbekistan and Tajikistan, where working-age populations remain large and fertility rates are only gradually declining.

Yet many cities remain underprepared. In Bishkek, Dushanbe, and Tashkent, informal settlements are expanding in peri-urban belts where access to cooling, sanitation, clean water, and reliable power is limited. These infrastructure deficits disproportionately affect migrants, women, and elderly residents—groups more vulnerable to extreme heat, water stress, and air pollution. Without forward-looking urban planning that integrates climate adaptation and demographic forecasting, Central Asia risks deepening spatial inequality and systemic exposure to climate hazards.

[35] United Nations Department of Economic and Social Affairs, Population Division, 2018. World Urbanisation Prospects: The 2018 Revision. United Nations, New York

3. The Prospects of a Demographic Dividend in Central Asia

This section of the report introduces the concept of the **demographic dividend**, a critical window of opportunity for accelerated economic growth. It explains how shifts in a country's age structure, specifically a larger working-age population and fewer dependents, can spur development.

3.1. The Demographic Dividend: A Window of Opportunity[36]

A demographic dividend[37] refers to the potential for accelerated and sustained economic growth that emerges when a country undergoes a demographic transition—typically marked by declining fertility and mortality rates. As fertility rates fall, the proportion of children in the population begins to decrease, leading to a gradual transformation in the population's age structure. Over time, a larger share of the population moves into the working-age group (15–64 years), while the dependent share—especially children—declines. This shift alters the dependency ratio, easing the financial and caregiving burden on families and the state.

This shift opens a critical window of opportunity.[38] With fewer dependants to support, families may be able to save more and invest in better nutrition, education, and health care for their children. At the macro level, governments can reallocate resources toward building human capital and expanding access to decent work, inclusive services, and infrastructure. A growing, healthier, and better-educated workforce can drive productivity, increase income generation, and support inclusive economic development—laying the foundation for shared prosperity and improved well-being.

However, the demographic dividend is not automatic.[39] Its realisation depends on the extent to which governments and societies implement timely, equity-driven policies that expand access to quality education, robust health systems, water, sanitation and hygiene, decent employment, and child and social protection. Strategic investments must prioritise the inclusion of all young people—particularly those facing the greatest disadvantage—ensuring they benefit from lifelong learning, skills development, and pathways to productive participation in the economy. Without these enabling conditions, demographic change may fail to translate into gains in human development or resilience and may even exacerbate existing inequalities. Unlocking the demographic dividend is, therefore, not only a matter of timely policy choices but also of prioritising rights-based, inclusive development pathways. The specific links between investments in human capital and the realisation of the demographic dividend is explored in the following sections of this chapter.

In Central Asia—comprising Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan—this demographic transition is already underway. The region has seen its population grow from approximately 17.5 million in 1950 to over 80 million today, with projections surpassing 114 million by 2050. Across these countries, fertility rates are gradually declining and life expectancy is rising, although at differing speeds. Consequently, the age structure is evolving, with a growing proportion of the population entering the working-age cohort.

While there are no fixed criteria defining the opening or closing of the demographic dividend window, it typically begins when the share of the working-age population starts to rise and fertility falls enough

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[36] This section is adapted from the Generation 2030: MENA Report, Investing in children and youth today to secure a prosperous region tomorrow (UNICEF 2017), which includes the demographic projections on which the dividend-related categorisations of Central Asian countries given here are based.

[37] Ahmed, S. Amer and Cruz, Marcio and Quillin, Bryce and Schellekens, Philip, Demographic Change and Development: A Global Typology (November 21, 2016). World Bank Policy Research Working Paper No. 7893, Available here.

[38] Galor, O. The demographic transition: causes and consequences. *Cliometrica* 6, 1–28 (2012). Available here.

[39] Caldwell, John C. "Toward A Restatement of Demographic Transition Theory." *Population and Development Review*, vol. 2, no. 3/4, 1976, pp. 321–66. *JSTOR*. Available here. Accessed 8 Aug. 2025.

to reduce the child dependency ratio. The window eventually narrows as the proportion of older adults increases and the working-age share declines, driven by sustained low fertility and population ageing.

This section presents a typology that classifies countries according to their potential to harness a demographic dividend. The classification is based on two key demographic indicators: the share of the working-age population (15–64 years) and the level of fertility; *see Box 1 below*.

Table 2. Dividend-related country categorisations and examples from Central Asian region[40]

Pre-dividend countries

Countries whose share of the working-age population (aged 15–64) is expected to increase between 2025 and 2035 have the potential to reap a demographic dividend. Among them, those with high total fertility rates (four or more births per woman in 2025) are classified as pre-dividend countries, as the opportunity for accelerated economic growth has not yet fully opened due to high child dependency ratios and continued population growth. No Central Asian country currently falls squarely into this category, although regional disparities within countries may still reflect pre-dividend characteristics in certain rural or marginalised populations.

Early-dividend countries

Countries experiencing a rising share of the working-age population and a fertility rate below four births per woman in 2025 are considered early-dividend countries. These nations are progressing through the demographic transition, with declining child dependency ratios and an expanding labour force. Uzbekistan, Kyrgyzstan, Turkmenistan, and Tajikistan fall within this category. Each of these countries is well positioned to harness the benefits of this shift, provided they implement the appropriate plans and programmes to develop their human capital.

Late-dividend countries

Countries projected to experience a decline in the share of their working-age population between 2025 and 2035 are approaching the close of their first demographic dividend window. These late-dividend countries, such as Kazakhstan, benefited from fertility reductions a generation ago (around 1995) and now have large working-age cohorts. To sustain gains, they must invest in economic productivity, ageing preparedness, and innovation to navigate an impending shift toward population ageing and increased old-age dependency.

Post-dividend countries

Post-dividend countries are characterised by long-term sub-replacement fertility and rising elderly populations, resulting in a shrinking workforce and diminishing demographic returns. This stage requires strategic investments in elder care, active ageing, and labour force participation among older adults. No Central Asian country has reached this stage yet, but trends in Kazakhstan indicate that the region must begin preparing for this transition through forward-looking social and economic policies.

[40] This categorisation follows the typology developed by the World Bank Group in their Global Monitoring Report 2015/2016 (World Bank Group. 2016. Global Monitoring Report 2015/2016: Development Goals in an Era of Demographic Change. Washington, DC: World Bank). Differences to the World Bank's classification come from slight differences in the adaptation of the criteria: this analysis here uses the total fertility rate for the exact years 2025 and 1990, respectively, while the World Bank used the period values 2015-2020 and 1985-1990.

3.2. Working-age and dependent populations

The region has entered a phase of exceptionally low dependency ratios, offering a demographic advantage that will narrow as ageing accelerates after the mid-2030s. The region has entered a period of exceptionally low dependency ratios. Central Asia currently benefits from a demographic structure that maximises its working-age population while dependency burdens remain subdued—a window expected to last until around the mid-2030s.

As of 2025, total dependency ratios in Central Asia have reached historic lows: approximately 61.7 dependents per 100 working-age individuals in Kazakhstan, 61.0 in Kyrgyzstan, 66.5 in Tajikistan, 56.3 in Turkmenistan, and 59.7 in Uzbekistan. During this period, child dependency declines sharply across countries—from 47.1 in Kazakhstan to 59.7 in Tajikistan—while old-age dependency is rising but remains relatively modest.[41] By 2035, old-age dependency increases substantially in some countries (for example, from 14.6 to 18.4 in Kazakhstan) but still does not outweigh the falling child dependency (*see Figure 10* and *Annex Figure B1* for the composition of total dependency ratios—child and old-age—for each country in Central Asia, 1950–2050).

This demographic opportunity hinges on two conditions: sustained investment in human capital for children and youth and inclusive labour markets that can productively engage the growing working-age cohort.[42] The UN Women Regional Gender Snapshot 2025 highlights that nearly one in four young women (15–24) in the ECA region are not in education, employment, or training (NEET), signalling untapped potential that, if addressed, could significantly amplify the demographic dividend through their expanded participation in the workforce.[43]

However, this advantage will not endure. By 2050, old-age dependency is projected to rise significantly—reaching 22.4 in Kazakhstan, 15.5 in Kyrgyzstan, 12.2 in Tajikistan, 16.3 in Turkmenistan, and 16.5 in Uzbekistan—while child dependency continues to fall modestly (for example, to 40.1 in Kazakhstan). This will gradually push total dependency ratios upward: to 62.5 in Kazakhstan, 53.9 in Kyrgyzstan, 54.8 in Tajikistan, 50.9 in Turkmenistan, and 58.9 in Uzbekistan.

Moreover, Central Asia is gradually transitioning into an ageing phase. According to the United Nations World Population Prospects (WPP 2024), the proportion of people aged 65 years and above is projected to rise markedly between 2020 and 2050—from 7.6 to 13.8 percent in Kazakhstan, 5.1 to 10.1 percent in Kyrgyzstan, 3.3 to 7.8 percent in Tajikistan, 3.8 to 10.8 percent in Turkmenistan, and 5.3 to 10.4 percent in Uzbekistan.[44] Internationally, countries where the 65+ population exceeds 7 percent are classified as ageing societies, and those with 14 percent or more as aged societies.[45] Based on current projections, Kazakhstan has already entered the ageing stage and will approach the aged category by 2050, while Turkmenistan and Uzbekistan will cross the ageing threshold by 2030, followed by Kyrgyzstan around 2030 and Tajikistan by 2050. These demographic transitions highlight the urgency of early investment in active-ageing policies, health systems, and social protection to ensure economic and social resilience across the region.

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41 United Nations, Department of Economic and Social Affairs, Population Division, World Population Prospects: The 2024 Revision (UN WPP), United Nations, New York, 2024.

42 United Nations Economic Commission for Europe (UNECE) & United Nations Population Fund (UNFPA). (2023). *Ensuring Rights and Choices amid Demographic Change: Report on the Implementation of the Programme of Action of the International Conference on Population and Development in the UNECE Region*. Geneva: United Nations. Available here.

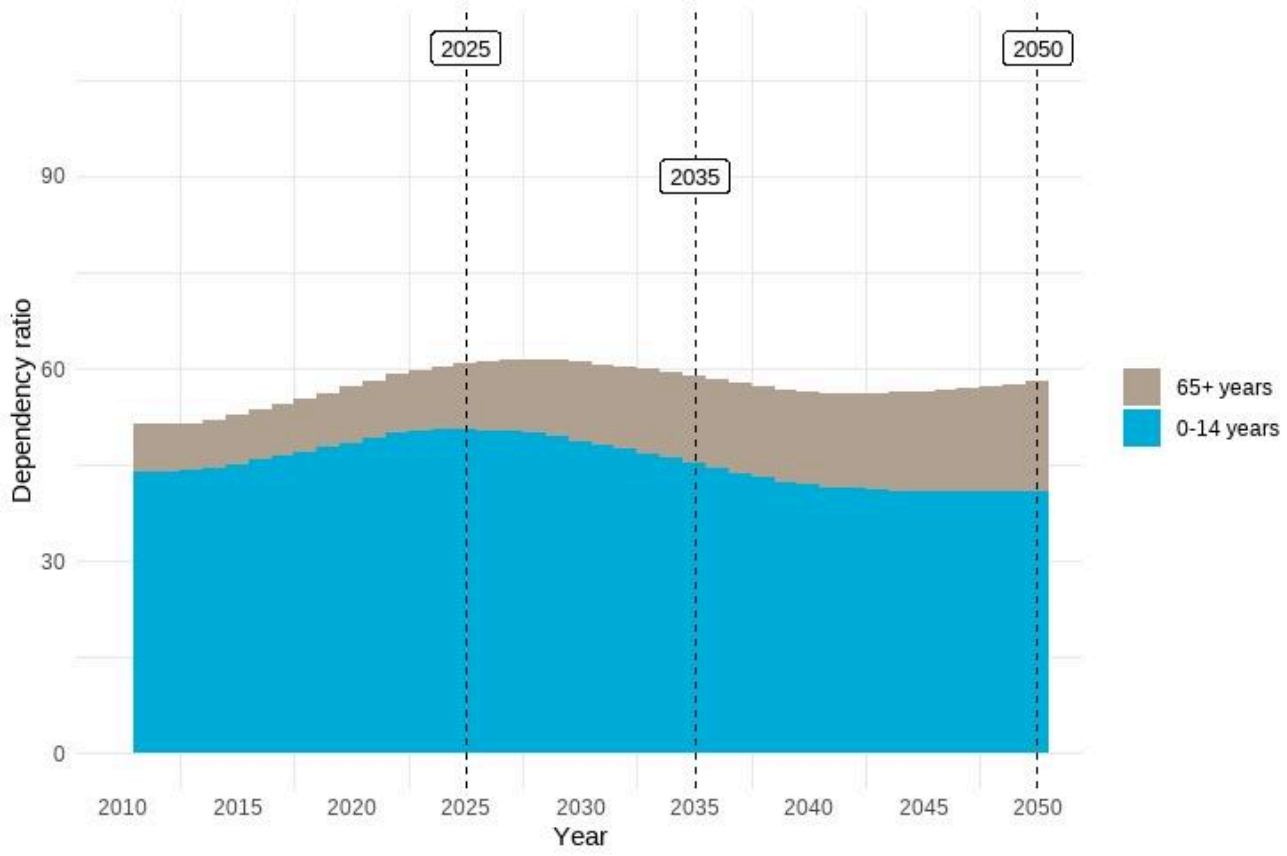
43 UN Women. (2025). *Gender snapshot for Europe and Central Asia 2025*. United Nations Entity for Gender Equality and the Empowerment of Women (UN Women). Available here.

44 United Nations Department of Economic and Social Affairs, Population Division, 2024. World Population Prospects: The 2024 Revision.

45 United Nations, Economic and Social Commission for Asia and the Pacific (ESCAP) (2022). Asia-Pacific Report on Population Ageing 2022: Trends, policies and good practices regarding older persons and population ageing (ST/ESCAP/3041).

This means that the years between today and 2040 are particularly critical. The most favourable period for Central Asia will be between now and 2040, when dependency ratios fall to historic lows—averaging about 60 dependents for every 100 people of working age. Governments must act now to strengthen human capital. The size, speed and quality of these investments will determine the extent to which Central Asia can convert today's demographic advantage into sustained, long-term gains in economic growth, human development, and social resilience.

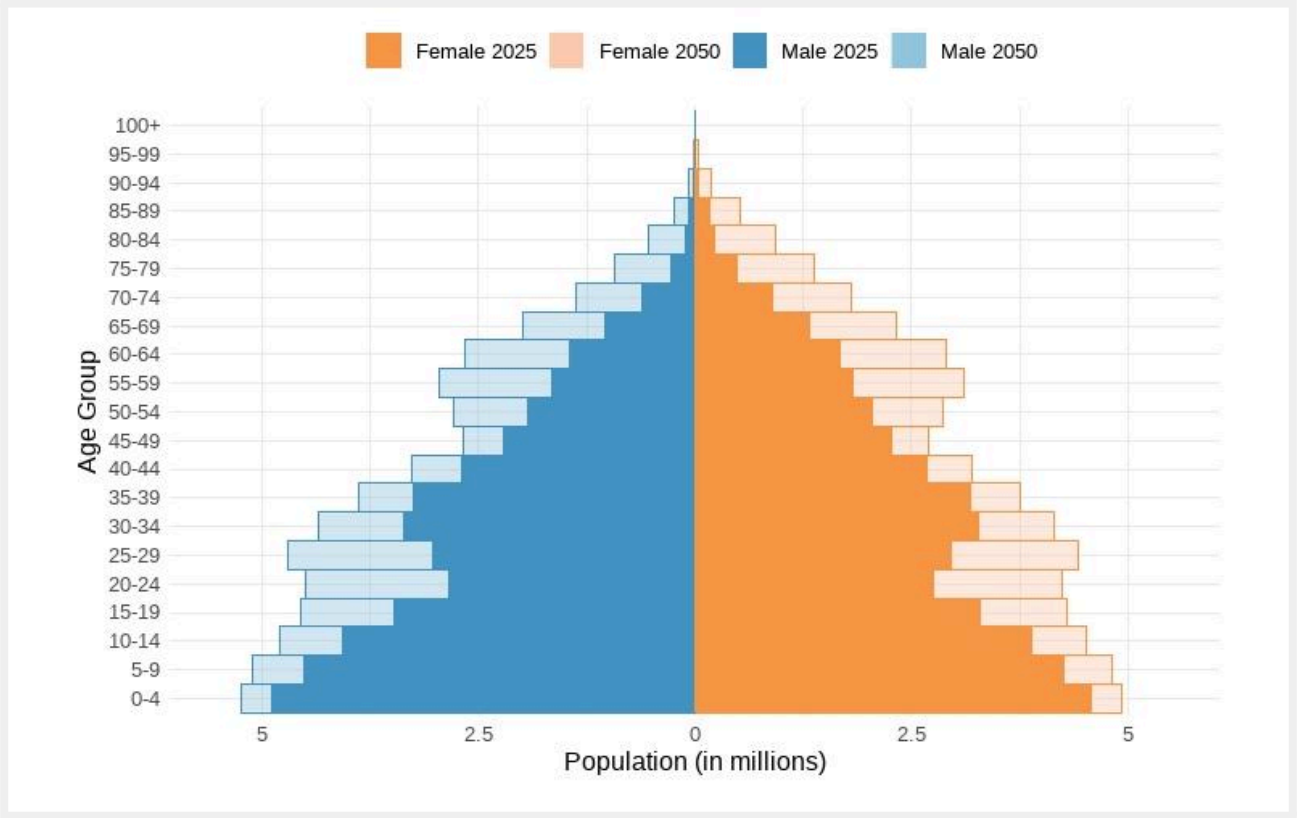
Figure 13. Composition of the total dependency ratio (child dependency ratio and old-age dependency ratio) for the Central Asian region, 2010-2050



Source: *UNICEF analysis based on United Nations, Department of Economic and Social Affairs, Population Division, World Population Prospects: The 2024 Revision (UN WPP), United Nations, New York, 2024.* ***Note:*** *Total dependency refers to the number of dependants (children under 15 years and older persons aged 65 and over) for 100 persons of working age (15-64 years).*

Rapid growth in the share of the elderly population will increase the median age in Central Asia from 26 years in 2015 to around 32 years in 2050. All five Central Asian countries are undergoing a shift from younger to older population profiles *(see Figure 11)* and have the opportunity to benefit from a demographic dividend, provided that supportive policies are in place. However, the timing and duration of this window will vary across countries, depending on the speed of fertility decline and gains in life expectancy *(see Figure 12)*.

Figure 14. Population of Central Asian region by age and sex, 2025 (darker) and 2050 (lighter)



Source: *UNICEF analysis based on United Nations, Department of Economic and Social Affairs, Population Division, World Population Prospects: The 2024 Revision (UN WPP), United Nations, New York, 2024.*

Figure 12 displays countries in Central Asia by demographic type in the years 2000 to 2050. Countries are categorised based on the methodology developed by the World Bank Group in their *Global Monitoring Report 2015/2016*,[46] but adapted to cover a longer period. The demographic type of a country is determined by two factors: (1) whether the working-age population is growing or shrinking and (2) the total fertility rate. As both can be projected into the future, countries' progression through demographic types can be predicted.[47]

In 2025, median ages range from 22.2 years in Tajikistan to 29.7 years in Kazakhstan. Tajikistan remains in the pre-dividend stage with a young population and high fertility. Kyrgyzstan (25.4 years) and Uzbekistan (27.0 years) are in the early-dividend stage, while Turkmenistan (26.9 years) is in mid-dividend, and Kazakhstan, nearing 30 years, is approaching the post-dividend stage.

Table 3. Uzbekistan's fertility trajectory

Uzbekistan's fertility trajectory is unusual within the region. Its total fertility rate rose from 2.44 in 2010 to a projected peak of 3.45 by 2025, likely reflecting a temporary demographic rebound driven by return migration, strong pronatalist norms in rural areas, and post-Soviet socioeconomic recovery.[48] Although the literature on this surge remains limited, projections indicate a steady

[46] World Bank Group, 2016. Global Monitoring Report 2015/2016: Development Goals in an Era of Demographic Change. World Bank, Washington, D.C.

[47] This representation is smoothed for short-term reversals and should be taken only as an approximate but nevertheless useful indication of the window of opportunity for a demographic dividend.

[48] Kurylo, I., Kadatskaya, N., Ishchanova, K., Ivlev, A., Kučera, T., Valitova, Z., Yessimova, A., Akramova, S., Abduramanov, K. and Khodjayev, S. (2023). Determinants of fertility growth in the Republic of Uzbekistan after 2017. Results of the national sample survey. Tashkent, United Nations Population Fund (UNFPA).

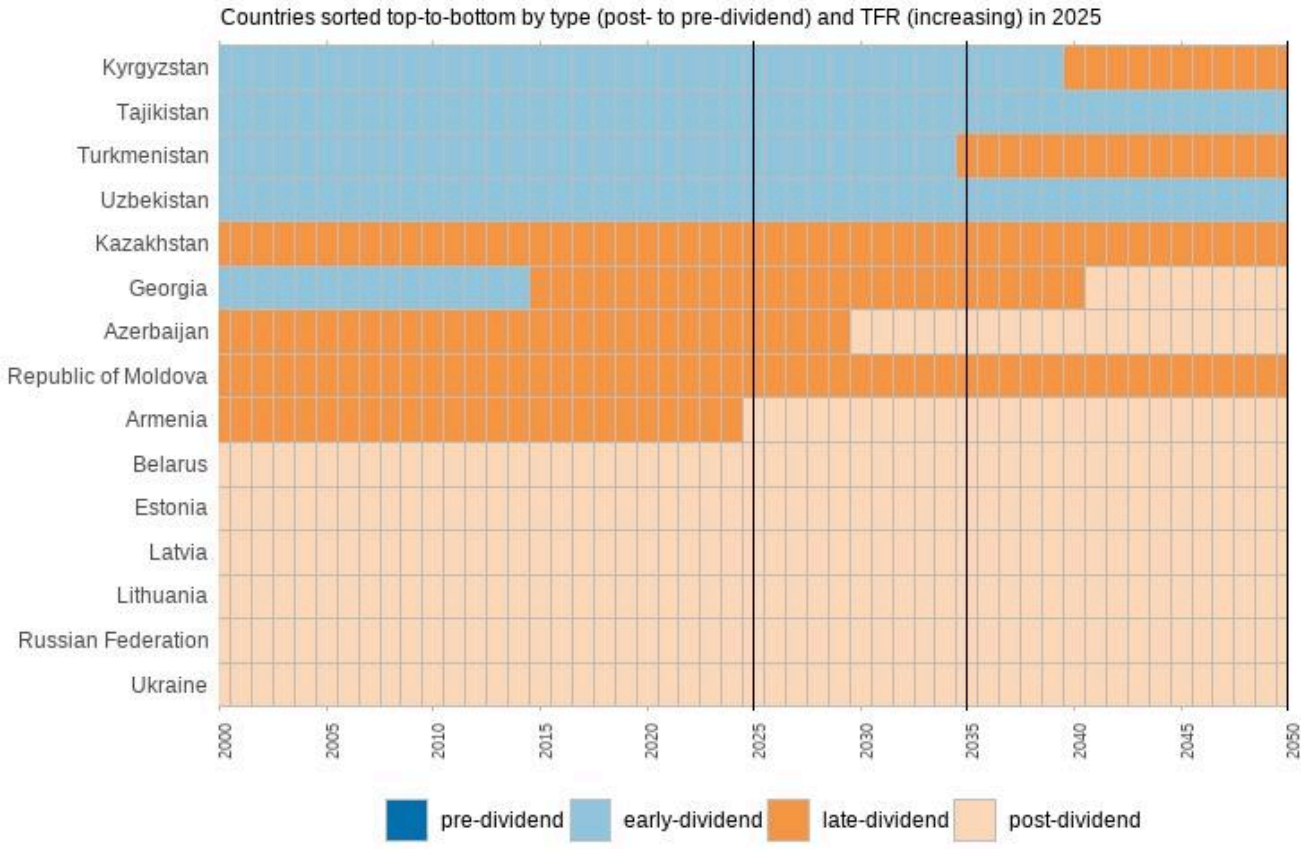
decline to 2.55 by 2050, shaped by urbanisation, rising female education, delayed marriage, and improved access to reproductive health services—mirroring broader demographic transition patterns in Central Asia. This slower decline allows Uzbekistan to retain a relatively youthful profile for longer, potentially extending its first-dividend window if paired with robust investments in human capital, labour-market readiness, and gender equality.

By 2050, median ages in Tajikistan, Kyrgyzstan, and Uzbekistan are still projected to remain under 31 years, compared to over 32 years in Turkmenistan and Kazakhstan.[49] See country examples in *Annex 2, Figure B2* for graphs for each country in the Central Asian Region, 1950-2050.[50] These varied timelines are largely explained by differences in fertility decline speed, starting age structures, and the pace of socio-economic transformation. Countries with slower fertility decline, such as Tajikistan and Uzbekistan, retain a larger youth population for longer, delaying the onset of rapid ageing. In contrast, Kazakhstan and Turkmenistan, which have experienced faster fertility reductions and earlier gains in life expectancy, are moving more quickly into higher median age brackets.

These demographic trajectories call for differentiated policy approaches. In countries with younger populations, priority should be given to maximising the demographic dividend through sustained investment in education, skills development, and decent job creation to ensure productive absorption of the expanding working-age cohort. In countries further advanced in the transition, the focus should shift towards securing remaining gains while preparing early for the economic and social implications of population ageing, including pension system sustainability, health system adaptation, and maintaining labour productivity in an ageing workforce.

[49] United Nations Department of Economic and Social Affairs, Population Division, 2024. World Population Prospects: The 2024 Revision.
[50] UNDESA Population Division, World Population Prospects, 2024 update (medium variant).

Figure 15. Countries in the Post-Soviet Region by Demographic Type (2000-2050)



Source: *UNICEF analysis based on World Bank 2016 (GMR 2015/2016), adapted for larger period and United Nations (UNPD WPP 2024)*

4. The role of human capital in achieving the demographic dividend

This section examines the role of human capital in realizing Central Asia's demographic dividend. It provides a high-level estimate of the economic returns from strategic investments, drawing on established economic models. The analysis demonstrates that as fertility rates decline, the "second dividend"—long-term economic growth—is predominantly driven by a better-educated and healthier workforce. The section will quantify the potential boost to GDP for each Central Asian country, underscoring the urgency of scaling up human capital investments to secure the region's future prosperity. It also includes case studies from other nations to illustrate the powerful link between human capital and successfully harnessing a demographic dividend.

4.1. The benefits of human capital investments in Central Asia

This section provides a high-level estimate of the returns to capturing the demographic dividend in Central Asia, and demonstrates how this is mostly unlocked through human capital investments. We use the seminal study 'Demographic Dividends, Human Capital, and Saving' (Mason, Lee, and Xue Jiang, 2016)[51] as the basis for this estimate. They employ an economic model with the parameters and initial conditions based on an archetypal developing country experiencing demographic transition. They find that countries experiencing a demographic transition can unlock two dividends:

1. The "first dividend" comes from the growth in the relative size of the workforce to the rest of the population (i.e., the support ratio) following fertility decline from a high rate (6+). This can provide an important but temporary boost to economic growth.
2. Then, slower population growth can yield a "second dividend" in the long-run, of which the majority of the economic returns are realised as a country's fertility rate falls to around 3 and continues to fall toward replacement fertility (2.1). At this phase, the second dividend arises principally from increases in the growth rates of two factors: human capital per effective worker and physical capital per effective worker. The impact pathway and relative influence of these two factors is outlined below and further elaborated in the annex.

The fertility rates of the five Central Asian countries in 2025 indicate that the region is entering the window of opportunity to realise the economic returns associated with the second dividend. As of 2025, the fertility rates of each Central Asian country is equal or near to 3 as presented in *Table 1* below, with a regional average of 3. Therefore, we can utilise the findings on the second dividend to project its prospective economic returns in Central Asia. The realisation of the second dividend depends largely on a scale-up in human capital investments.

Table 4. Projected fertility rate (births per woman) in Central Asian countries in 2025 and 2030

	2025	2050
Kazakhstan	3.0	2.4
Kyrgyzstan	2.8	2.2
Tajikistan	3.0	2.4
Turkmenistan	2.6	2.1
Uzbekistan	3.4	2.6

Source: *UN World Population Prospects*

[51] Available here.

The second dividend is realised as additional growth in net production per worker, driven primarily by human capital deepening. As families have fewer children, private (household) investments per child rise – the quantity-quality tradeoff modelled by Becker and Barro (1988).[52] The model employed by Mason, Lee, and Xue Jiang (2016) builds on this, with robust cross-sectional estimates[53] that the quantity-quality tradeoff characterizes public spending on human capital, as well. Therefore, combined (public and private) spending on human capital per capita tends to increase with income. The report acknowledges that, as a country transitions from a fertility rate of 3 toward replacement fertility, total spending on physical capital – i.e., tangible, man-made resources such as machinery, tools, buildings, and infrastructure – will typically increase more than investments in human capital, in absolute terms. However, to unlock the economic returns associated with the second demographic dividend, the *speed* of growth in human capital spending must exceed the growth rate of physical capital spending. This would see spending on human capital come to constitute an increasing share of total spending, as seen during the historic transition of contemporary developed states into advanced economies. Critically, the model distinguishes the relative contribution of the different types of capital (human versus physical) in driving productivity gains as a country experiences its second demographic transition.

The model finds that **the deepening of human capital per worker[54] is responsible for two-thirds of the growth in net production per worker.** Net production refers to the output produced per worker which is consumed rather than output that is saved or invested.[55] In other words, **the second dividend is realised as a growth in per capita consumption, of which two-thirds is driven by investments in human capital.** The remaining one-third depends on investments in physical capital. This finding reiterates the primacy that countries in Central Asia should give to scaling up human capital investments as they undergo demographic transition. Nevertheless, continuing to upgrade physical infrastructure is important is maximising the returns on human capital deepening: an increase in physical capital per effective worker[56] typically leads to higher labour productivity, as workers have better tools and equipment to perform their tasks more efficiently. Yet failing to increase spending on human capital at a faster rate than increases on physical capital risks forgoing the economic returns associated with the second dividend.

To measure the scale-up in human capital required to realise the second dividend across countries, it is necessary to normalize human capital spending. Normalising spending allows for a direct comparison of the allocation decisions of countries with very different levels of income, as is the case across the Central Asia region. The Mason et al. paper achieves this by dividing the amount of human capital spending per child by the average labor income of adults 30 to 49 years of age. This age group is used to avoid the effects of educational enrollment and early retirement on labor income,

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52 Becker GS, Barro RJ. A Reformulation of the Economic Theory of Fertility. Quarterly Journal of Economics. 1988; 103(1):1–25.

53 Based on 39 countries included in the National Transfers Account (NTA) project at that time, covering low-, middle- and high-income countries.

54 Human capital per effective worker is equal to the cumulative investment in human capital per person of working age, and the effectiveness with which those at that age are engaged in GDP-producing activities. Total human capital in a given period is calculated by multiplying by the population of each age and summing across age. Dividing by total output yields the human capital intensity of the economy.

55 The model assumes that the capital-output ratio is fixed, therefore the behavioral mechanisms that determine saving and investment in physical capital are of secondary interest. The authors cite various studies which show that the capital-output ratio has been relatively constant over extended periods of time in many countries. In addition, based on studies that show a strong positive correlation between the saving rate and the rate of GDP growth, known as the rate of growth effect, the saving rate is reduced just enough to keep the capital-output ratio constant. These assumptions allow for an additional effect on consumption. With either constant savings rate or constant capital-output ratio, slower population growth generates a “second dividend” with higher consumption.

56 Physical capital per effective worker accounts for both the quantity and quality of capital that workers can utilize, considering advancements in technology that enhance productivity.

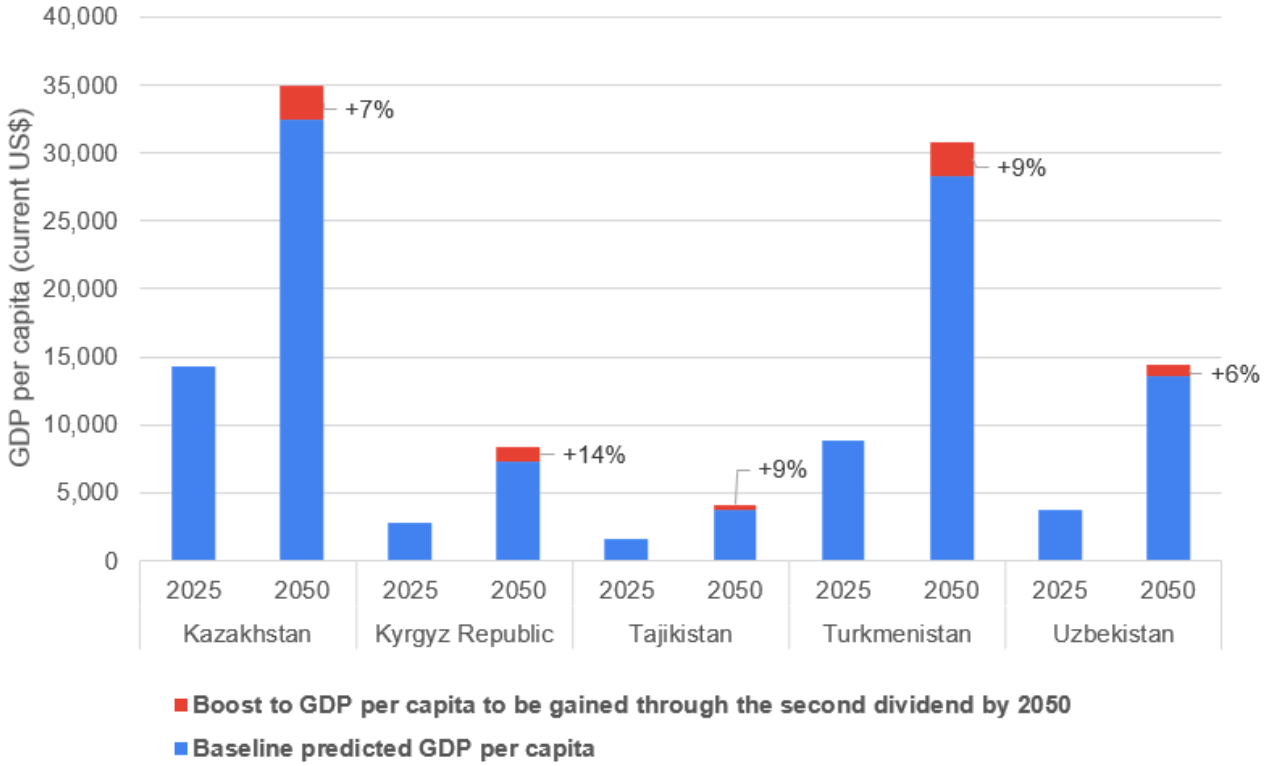
enabling a more accurate representation of the average child's human capital claim on labor income.[57] Therefore, human capital spending in each country is expressed in YoLY, that is years of average labor income for ages 30 to 49. In line with the model's parameters, the realisation of the second dividend in Central Asia depends on human capital spending exceeding the global average for developing countries (2.7 YOLYs) by 2050, and pushing toward the global average for high-income countries (4.4 YOLYs). This normative benchmark aligns with the scale of the investment needs that has been modelled for each country in Central Asia – see each Country Annex.

Projecting the prospective economic returns of the second demographic dividend in Central Asia relies on two factors: the speed of fertility decline and the share of consumption in the economy. A faster decline toward replacement fertility is found to unlock faster growth in consumption (or net production) per capita. Relatedly, the impact of this growth on the economy depends on the relative size of consumption as a share of the economy. Annex 1 contains information on how each Central Asian country performs (and is projected to perform) in terms of these two factors. Further, Annex 1 provides an overview of our application of 'convergence theory' to project the baseline or 'business-as-usual' economic growth that can be expected between now and 2050, independent of a change in the governments' approach to human capital investments.

The results show that the second dividend has the potential to boost the GDP of Central Asian countries by an additional 6 to 14 percent by 2050 *(Figure 13)*. The Kyrgyz Republic exhibits the highest prospective boost to GDP by 2050 (14%) which can be explained by its relatively faster decline to replacement fertility by 2050 and the relatively high share of consumption as a share of the country's GDP. Conversely, Central Asian countries with slower fertility declines and/or smaller shares of consumption as a share of GDP are projected to have relatively smaller economic returns to the second dividend.

[57] One motivation for expressing human capital investment in YoLYs is that it allows direct comparison of the allocation decisions of countries with very different levels of income. Another potentially important use is that it controls in a crude fashion for across country variation in labor costs.

Figure 16. Gross Domestic Product (GDP) per capita (current US$) in 2025 and 2050 at baseline and under the scenario where the second dividend is realised.



Source: *Authors – methodology and data sources are elaborated in Annex 1.*

The necessity to leverage human capital to achieve sustainable growth aligns with the Central Asian countries' aspirations to escape the middle-income trap. The 3i strategy outlined in the *World Development Report 2024*[58] – investment, infusion, and innovation – makes clear that it is essential for Central Asian countries to invest in human capital deepening to reach high-income status. Economies must evolve from simply accumulating capital and adopting foreign technologies to creating and adapting knowledge themselves. This shift to innovation-driven growth requires a workforce with advanced skills, creativity, and scientific capability. Yet many middle-income economies struggle because they fail to build strong talent systems as poor learning outcomes compounded by weak links between education and industry results in wasted talent. To move from investment-driven growth toward infusion and innovation requires not just better schooling but also stronger healthcare systems that ensure a productive workforce, and comprehensive social protection that allows people to take risks, retrain, and adapt as industries evolve. Inadequate investment in these areas can entrench inequality and limit social mobility – key barriers to innovation-led growth. Likewise, active labor market and youth employment policies are vital to prevent brain drain and to harness the region's demographic potential. For Central Asia, developing an educated, healthy, and secure population capable of learning and innovating is the cornerstone of transitioning from imitation to creation; without it, countries in the region will likely struggle to build the foundations required to escape the middle-income trap.

Investing in human capital as the Central Asian countries experience demographic transition is shown to be a potentially significant driver of economic growth. As the region's population growth begins to slow and approach replacement fertility, the window of opportunity for Central Asian countries to realise the demographic dividend is closing. Realising the "second dividend" associated with growth in human capital per effective worker and physical capital per effective worker is therefore

[58] The World Bank (2024). The Middle-Income Trap.

critical to ensuring the region's long term economic prosperity. Of these two factors, human capital deepening is responsible for two-thirds of the second dividend, driving growth in net production per worker. The need and urgency to scale-up human capital investments in Central Asia cannot be understated.

4.2. Lessons learned from other countries

To translate the theory of the demographic dividend into a practical roadmap for Central Asia, it is instructive to look at the real-world experiences of other nations. History offers tangible lessons on what works, what doesn't, and why. By examining the paths of countries that have already and still continue to navigate the demographic transition, we can move beyond abstract models to understand how best Central Asia countries can position themselves for success.

This section presents four case studies that serve as a guide—highlighting both cases of significant and minimal success in achieving the demographic dividend. Each country was chosen because they recently experienced a demographic transition which most Central Asian countries are likely to go through between now and 2050. Each Central Asian country currently has a Total Fertility Rate of between 3.5 and 2.7, but is expected to reach near to replacement levels by 2050.

We will explore two significant success stories:

South Korea and Singapore: These nations successfully paired their demographic transition with strategic, sustained investments in human capital—specifically education, health and job creation. As a result, they reaped a significant demographic dividend, experiencing remarkable economic and social progress.

We will contrast these with two countries that had minimal success in achieving their dividend:

Nicaragua and Cambodia: These countries also faced a similar demographic opportunity but were unable to fully capitalize on it. Hindered by factors such as inconsistent investment in quality education and challenges in creating a dynamic job market, their economic growth during this period was less significant.

Table 5. The case of South Korea

The Case of South Korea

Size of demographic dividend: ★ ★ ★ ★ ★

Relevant period of fertility decline: 1960–1982 (TFR from 6 to 2.1)

GDP per capita (current US$): 1990: $158.3, 1983: $2,198.9

The Role of Human Capital Investments

South Korea's goal in the 1960s and 1970s was rapid industrialization, supporting its large chaebols (industrial conglomerates). Its human capital strategy was built to supply this industrial machine with millions of literate, technically competent workers.[59] The government made universal primary education (6 years) a top priority and achieved it by the 1960s.[60] This created a vast, literate labor pool that could be easily trained for factory work. This was a strong foundation for achievements that followed. The Vocational Training Act (1967) legally mandated the creation of a nationwide system of public vocational training centers.[61] These centers trained workers for the specific jobs the new heavy and chemical industries needed: welders, machinists, electricians, and construction workers. Additionally, in the 1970s**, the Levy System by the government legally required all large companies to either provide in-house vocational training for their own employees or pay a "training levy" to the government.[62] This forced the private sector to co-fund national skill development, ensuring a constant supply of skilled labor. In the 1970s,** the government invested into universities, but specifically targeted engineering, science, and technology.[63] This was a top-down decision to create the R&D and high-level management workforce required for the next phase of industrialization.[64]

Key takeaway for Central Asian countries

South Korea is a powerful example of how large-scale investments in education (supply of human capital) create an impactful outcome. Central Asian governments should elevate Technical and Vocational Education and Training (TVET) to be a prestigious, first-choice career path, not a last resort. This means investing heavily in modernizing TVET centers, ensuring their curricula are high-quality, and linking them directly to the needs of the job market.

Table 6. The case of Singapore

The Case of Singapore

[59] Han, J. S., & Lee, J. W. (2020). Demographic change, human capital, and economic growth in Korea. Japan and the World Economy, 53, 100984.
[60] Kent, D. C. (2017). A New Educational Perspective: The Case of Singapore. Penn GSE Perspectives on Urban Education, 14(1), n1.
[61] Lee, J. W., Han, J. S., & Song, E. (2019). The effects and challenges of vocational training in Korea. International Journal of Training Research, 17(sup1), 96-111.
[62] Australian Aid (2014) Republic of Korea: Training Levy System—Train or Pay. https://www.skillsforemployment.org/sites/default/files/2024-01/wcmstest4_172858.pdf#:~:text=A6.7%20Republic%20of%20Korea:%20Training%20Levy%20System%E2%80%94Train%20or%20Pay&text=finding%20of%20the%20review%20is%20that%2C%20despite%20potentially%20large
[63] Kwon, K. S. (2015). Evolution of universities and government policy: The case of South Korea. Asian Journal of Innovation and Policy, 4(1), 103-127.
[64] Ibid

Size of demographic dividend: ★ ★ ★ ★ ★

Relevant period of fertility decline: 1960–1976 (TFR from 5.8 to 2.1)

GDP per capita (current US$): 1960: $428.1, 1976: $2,758.9

The Role of Human Capital Investments

The government established English as the language of business, law, and technology, instantly making its entire population employable by any international company. It also required students to learn a "Mother Tongue" (Mandarin, Malay, or Tamil) to ensure social cohesion and cultural identity.[6566] The government actively partnered with MNCs. For example, it would create technical institutes in partnership with companies, ensuring the curriculum, equipment, and training methods were exactly what the industry needed.[67] There was a strong connection between what students learned and what employers required. The government also set up the Skills Development Fund which promotes and enhances the skills and expertise of individuals at various stages of their professional journey.[68] Its objectives include fostering the development and upgrading of skills among those preparing to enter the workforce, individuals currently employed, and those re-entering employment. Additionally, the Fund supports the retraining of retrenched workers and provides financial assistance—through grants, loans, or other means—to achieve these objectives.[69] Finally, the government's massive investment in high-quality public housing and public health was a direct human capital strategy.[7071] It ensured the workforce was not only skilled but also healthy, stable, and had a tangible stake in the nation's success.

Key takeaway for Central Asian countries

Central Asian countries should learn to move from a rigid, "supply-driven" education system (where universities produce graduates and hope they find jobs) to a flexible, "demand-driven" one. All key stakeholders including ministries of education, universities, vocational institutes, private sector and other core bodies should avoid working in silos and coordinate more effectively. Building the human capital also means making investments in public health, nutrition, and sanitation, especially for children. A healthy, well-nourished child is a prerequisite for a learning student and a productive future worker. These are the foundational investments of a demographic dividend.

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[65] NUS(2021)Singapore bilingual education: One policy, many interpretations. https://fass.nus.edu.sg/srn/2021/09/07/singapore-bilingual-education-one-policy-many-interpretations/

[66] EssentialEducation(2024) The Evolution of Singapore's Education System: From 1965 to the Present. https://www.essentialeducation.com.sg/blog/the-evolution-of-singapores-education-system-from-1965-to-the-present#:~:text=Emphasis%20on%20Bilingualism%3A%20The%20bilingual,roots%20and%20identity%20were%20preserved.

[67] CEDOL (2021) Linking TVET with economic expansion. https://www.cedol.org/wp-content/uploads/2013/09/Linking-TVET-with-economic-expansion-Seng.pdf#:~:text=partnering%20multinational%20corporations%20(MNCs)%20such%20as%20Tata

[68] UNESCO (2022) Global Review of Training Funds. https://unevoc.unesco.org/countryprofiles/docs/UNESCO_Funding-of-Training_Singapore.pdf

[69] Ibid

[70] MND(n.d) Our Early Struggles.https://www.mnd.gov.sg/our-city-our-home/our-early-struggles

[71] Docomomo (n.d) HDB Public Housing 1960 – 1980 | The First Two Decades. https://www.docomomo.sg/happenings/hdb-public-housing-1960-1980-the-first-two-decades

Table 7. The case of Cambodia

The Case of Cambodia

Size of demographic dividend: ★ ★ ★

Relevant period of fertility decline: 1978–2023 (TFR from 3.34 to 2.58)

GDP per capita (current US$): 1978: $147.1 , 2023: $2,430

The Role of Human Capital Investments

Cambodia has successfully moved from low-income to lower-middle-income status, but progress toward upper-middle-income status remains elusive. Achieving this transition depends heavily on the human development of today's adolescents and youth, whose skills and productivity will shape the country's labor force in the coming decades.[72] Educational attainment, especially in upper secondary and postsecondary education, will be decisive in determining whether young people can drive productivity growth, while broader economic dynamics—such as diversification and structural transformation—will affect whether they find productive employment opportunities for the skills they acquire.[73]

Currently, Cambodia faces significant challenges in education outcomes. Learning poverty is 55.5 percentage points higher than the East Asia and Pacific average and 29.6 percentage points higher than the lower-middle-income country average, reflecting serious gaps in foundational learning.[74] Although the share of youth (ages 15–24) with at least lower secondary education increased from 27% in 2008 to 42% in 2019, the majority of young people still lack the educational foundation required to participate in more productive and higher-value sectors.[75] While Cambodia has nearly achieved universal primary education, issues of access and quality at the secondary level remain pressing. Addressing these challenges will require more relevant curricula, better-trained teachers, and stronger investments in school infrastructure and resources.[76] Young people in Cambodia are increasingly uncertain about the value of education in improving their future prospects.[77]

Unless the country significantly raises learning outcomes and expands access to secondary and postsecondary education, the majority of youth may remain trapped in low-productivity work. This would limit economic competitiveness and slow progress toward upper-middle-income status.

Key takeaway for Central Asian countries

The case of Cambodia explains why secondary, vocational and post secondary education are critical in building the technical skills, critical thinking, and adaptability needed for a modern economy. Ensuring both high enrollment rates and high-quality learning outcomes at this stage is crucial. This requires updating curricula, strengthening career guidance, and building strong links between schools and employers. Young people need to be confident that their hard work in school will lead to tangible opportunities.

72 Cambodia Ministry of Planning (2021). The Profile of Demographic and Gender Dividend in Cambodia. Available here.
73 Ibid
74 World Bank (2022). Cambodia Learning Poverty Brief. Available here.
75 Cambodia Ministry of Planning (2021). The Profile of Demographic and Gender Dividend in Cambodia. Available here.
76 Ibid
77 Ibid

Table 8. The Case of Nicaragua

The Case of Nicaragua

Size of demographic dividend: ★ ★ ★

Relevant period of fertility decline: 2000–2023 (TFR from 3.12 to 2.22)

GDP per capita (current US$): 2000: $1,017.3 , 2023: $2,609.40

The Role of Human Capital Investments

Nicaragua modestly improved over the period of decline in total fertility rate. Despite the shift from low income to low middle income, the country may have made more significant gains in its demographic dividend if it had increased investment in human capital. Recent data (pre–COVID-19 school closures) reveal major gaps in learning outcomes in Nicaragua.[78] About 79% of late-primary-age children lack basic reading proficiency, once out-of-school children are included.[79] This is 27 percentage points worse than the regional average for Latin America and the Caribbean (LAC) and 18 points worse than the average for lower-middle-income countries (LMCs).[80] Similarly, by the end of primary school (grade 6, 2019), 78% of students had not reached the Minimum Proficiency Level (MPL)—27 points worse than the LAC average and 20 points worse than the LMC average.[81] School access is somewhat stronger: only 4% of primary-age children are out of school, roughly on par with the LAC average and slightly better than the LMC average.[82] Yet, because out-of-school children are automatically considered below proficiency, these enrollment gaps also contribute to low learning outcomes. The extremely low levels of learning proficiency undermine the country's ability to translate its youthful population into a productive labor force. Without urgent investment in education quality—especially foundational literacy and numeracy—the country risks not fully benefitting from the demographic dividend.

Key takeaway for Central Asian countries

The most critical lesson from Nicaragua is that getting children into school is only the first step and means very little if they are not actually learning. Nicaragua achieved good primary school enrollment rates, on par with regional averages. However, with 79% of children lacking basic reading proficiency, the country failed to build the foundational human capital needed for a productive workforce. The focus for Central Asia must shift from enrollment numbers to measurable learning outcomes. Investing in teacher quality, modern curricula, and robust assessment systems is essential to ensure that a schooled population is also an educated and skilled one. Education spending should be viewed as a critical economic rather than an expense. Underfunding education quality directly undermines the potential of the demographic dividend.

78 World Bank (2024) Nicaragua Learning Poverty Brief. Available here.
79 Ibid
80 Ibid
81 Ibid
82 Ibid

5. An Investment Portfolio to Achieve the Demographic Dividend in Central Asia

Having established the demographic context and the potential for a demographic dividend, this section of the report transitions from analysis to action. It presents a detailed **investment portfolio** designed to build the human capital necessary for Central Asia to achieve this dividend.

This portfolio is built upon interventions across six critical sectors: Child Protection, Social Protection, Education, WaSH, Health and Nutrition, and Youth Employment. A core principle of this strategy is the recognition that these sectors are not independent but interconnected. The potential of this portfolio lies in the synergies between them, where strategic investment in one area multiplies the returns in another. Achieving the demographic dividend depends on investing in these sectors together to create a cumulative impact that is greater than the sum of its parts.

For each sector, a consistent approach was used to assess the current situation, identify gaps, and propose cost-effective interventions. Several methodological steps were included:

1. **Baseline Assessment:** Key performance indicators were selected for each sector based on international standards (e.g., Sustainable Development Goals), data availability, and the extent to which improving the indicators was a regional priority. Data was compiled from a range of sources, including UNICEF Data, World Bank EdStats, ILOSTAT, the WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP), and national statistical agencies. Establishing the extent to which improving the indicators was a regional priority was conducted via an analysis of each government's key policies and strategies.
2. **Target Setting:** Ambitious but achievable targets were set for 2035 and 2050. In many cases, this involved aiming for universal coverage (100%) or meeting established international benchmarks. It also took into consideration country priorities through the policy and strategy review conducted above. For indicators where no global standard exists (e.g., social service workforce density), the regional best performer was used as a benchmark to ensure contextually relevant and aspirational goals.
3. **Intervention Selection:** Cost-effective, high-impact interventions were identified based on a review of global evidence and their alignment with the specific challenges and national priorities within Central Asia, such as early childhood development (ECD). The selection process prioritised foundational investments with the potential for catalytic, cross-sectoral impact (e.g., strengthening the social service workforce, expanding universal child benefits).

The portfolio is organized by key sectors, including child protection, social protection, education, health and nutrition, WaSH (water, sanitation and hygeine), and youth employment. For each sector, the analysis will:

- Provide a brief introduction to the sector and its importance for human capital development.
- Assess the current situation in Central Asia, highlighting key performance indicators and regional disparities.
- Identify a set of cost-effective, high-impact interventions with specific targets.
- Outline core principles for ensuring that these investments are implemented effectively, efficiently, equitably, and with consideration of environmental risk.

5.1. Child Protection

5.1.1. Introduction to the Sector

Child protection refers to efforts to prevent and respond to all forms of violence, abuse, neglect, exploitation, and harmful practices that affect children.[83] It is rooted in the principles of the Convention on the Rights of the Child (CRC) and is closely aligned with the Sustainable Development Goals (SDGs). Child protection is a universal mandate; it applies to every child, in every setting, regardless of a country's income level or development status.

The child protection system includes "Certain formal and informal structures, functions and capacities that have been assembled to prevent and respond to violence, abuse, neglect, and exploitation of children".[84] It also includes different actors – children, families, communities, those working at sub-national or national level and those working internationally. Most important are the relationships and interactions between and among these components and these actors within the system. It is the outcomes of these interactions that comprise the system.[85]

5.1.2. The Importance of Child Protection for Achieving the Demographic Dividend

Protecting children from violence, exploitation, neglect, and harmful environments is not only a moral and legal obligation—enshrined in the United Nations Convention on the Rights of the Child—but a critical investment in human capital development. Child protection plays a foundational role in shaping the health, education, and productivity outcomes that determine a country's long-term growth and prosperity. The formation of human capital is influenced by a complex interplay of risk and protective factors operating at both the individual and contextual levels.[86]

According to the Nurturing Care Framework, these factors fall under five domains: health, nutrition, caregiving, security and safety, and early learning. When protective factors outweigh risks, children are more likely to develop to their full potential. Conversely, when risk factors dominate—such as violence, neglect, or lack of nurturing care—human capital development slows or even regresses.[87]

Inadequate care and protection present significant risks to human capital accumulation, which is essential for realizing the demographic dividend.[88] Violence and neglect, for example, are leading contributors to early death and poor health outcomes. Girls forced into early marriage and sexual activity often become pregnant before their bodies are physically prepared, which increases both maternal and child mortality. Adolescent mothers (aged 10–19 years) are at greater risk of experiencing complications such as eclampsia, puerperal endometritis, and systemic infections compared to women aged 20–24.[89] Their babies are also more likely to be born with low birth weight, arrive prematurely, or suffer from serious neonatal conditions. All these conditions do not augur well for human capital formation.

Children who are brought up in institutional/residential instead of family and family-based alternative care suffer consequences which have implications for human capital development. Such children often experience structural neglect, characterized by limited physical resources, high staff turnover or inadequate staffing, and emotionally insufficient or inconsistent interactions between

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83 UNICEF (2021) Child Protection Strategy. Available here.
84 UNICEF (2021) Child Protection Systems Strengthening. Available here.
85 UNICEF (2021) Child Protection Systems Strengthening. Available here.
86 Wulczyn, F., Parolini, A., & Huhr, S. (2021). Human capital and child protection: A research framework in the CRC context. *Child Abuse & Neglect*, *119*, 104610.
87 Ibid
88 Mason, A., Lee, R., & Jiang, J. X. (2016). Demographic dividends, human capital, and saving. *The Journal of the Economics of Ageing*, *7*, 106.
89 WHO (2024) Adolescent pregnancy. Available here.

caregivers and children.[90] Additionally, children raised in residential institutions often exhibit behavioral patterns uncommon among those reared in family environments.[91] These may include repetitive or self-stimulating behaviors (such as rocking, head-banging, or arm-waving), difficulties with attention and impulse control, both internalizing and externalizing behavioral problems, a high incidence of disorganized or unclassifiable attachment in structured assessments, and tendencies toward indiscriminate friendliness.[92] The institutionalization of children has far-reaching consequences—not only for the children and their families but also for society at large—as it reinforces stigma, deepens social isolation, and perpetuates an intergenerational cycle of disadvantage.[93] Individuals with a history of institutional care are significantly more likely than the general population to face unemployment, mental health challenges, incarceration or psychiatric hospitalization, and episodes of homelessness at some point in their lives,[94] affecting human capital development.

Migration-related family separation is also a driver of child abandonment, with serious implications for child well-being and human capital development. While remittances from migrant workers often contribute positively to poverty reduction, migration can have unintended adverse effects on children left behind.[95] In some cases, migrant parents do not return due to death, infidelity, or abandonment, leaving the remaining caregiver—most often the mother—in a precarious situation.[96] This vulnerability sometimes may compel the remaining parent to migrate as well, resulting in children being effectively abandoned twice and facing heightened risks of poverty, behavioral challenges, educational disruption, and emotional distress. Additionally, out-migration can create local labor shortages, which left-behind children are often expected to fill.[97] They take on substantial household and agricultural tasks—such as fetching water, cleaning, herding, milking, and childcare—leaving limited time and energy for schooling. Caregivers of older children particularly note the increased burden of labor and its detrimental impact on education and overall development.

The absence of consistent, nurturing care also undermines cognitive and emotional development. Young children in institutional care, especially those who lack stable attachment to a caregiver, often experience delays in physical growth, language development, and intelligence.[98] By contrast, attentive and loving caregiving during early childhood has been shown to reduce stunting and foster development, yielding results comparable to nutritional interventions.[99] Moreover, children exposed to violence or exploitation in the home, community, or workplace are less likely to attend or perform well in school. Child laborers, for instance, often struggle to balance work and school, with long hours preventing many from enrolling at all.[100] These disruptions in learning and development weaken the foundation of future human capital, ultimately reducing a country's capacity to build a productive, skilled, and healthy workforce.

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[90] Van IJzendoorn, M. H., Palacios, J., Sonuga-Barke, E. J., Gunnar, M. R., Vorria, P., McCall, R. B., ... & Juffer, F. (2011). I. Children in institutional care: Delayed development and resilience. Monographs of the Society for research in child development, 76(4), 8-30.

[91] Bos, K. J., Fox, N., Zeanah, C. H., & Nelson, C. A. (2009). Effects of early psychosocial deprivation on the development of memory and executive function. Frontiers in behavioral neuroscience, 3, 715.

[92] Ibid

[93] UNICEF (2023) The impact of family separation and the institutionalization of children is devastating and lifelong.. https://www.unicef.org/eca/reports/focus-ending-institutionalization-children-and-keeping-families-together

[94] The Centre for Social Justice (2015) Finding Their Feet: Equipping care leavers to reach their potential. https://www.centreforsocialjustice.org.uk/library/finding-their-feet-equipping-care-leavers-to-reach-their-potential

[95] UNICEF (n.d) Remittances and children. https://www.unicef.org/innocenti/remittances-children

[96] Ismailbekova, A. (2015). Single mothers in Osh: Well-being and coping strategies of women in the aftermath of the 2010 conflict in Kyrgyzstan. Focaal, 2015(71), 114-127.

[97] Scott, C. K., Sexsmith, K., & Chi, G. (2025). Caretaker perceptions of the effects of parental migration on left-behind children in rural Kyrgyzstan. Development in Practice, 1-18.

[98] Bilson, A (2009) Use of Residential Care in Europe for Children Under Three: Some Lessons from Neurobiology. British Journal of Social Work (1-12)

[99] World Bank (2009) Supplementing Nutrition in the Early Years: The Role of Early Childhood Stimulation to Maximize Nutritional Inputs. Children and Youth, Vol 3, No.1, World Bank, New York

[100] UNESCO (2010) Education for All. A Global Monitoring Report 2010. Reaching the Most Marginalised, UNESCO, Paris

Violence within the school environment itself remains a serious barrier to learning and well-being.[101] Physical punishment, bullying, and peer violence can severely impact children's physical and mental health, limit their ability to learn, and in extreme cases, result in death.[102] However, the consequences of violence and inadequate protection extend far beyond childhood.[103] Children who grow up in institutional care or experience abuse are at higher risk of long-term mental health challenges, chronic diseases, and behavioral issues. These include depression, anxiety, obesity, cardiovascular disease, substance abuse, and unsafe sexual behaviors, among others.[104] These outcomes can compromise their ability to complete education, secure employment, and participate meaningfully in society—ultimately undermining the development of a healthy, skilled, and productive population essential for national growth and human capital formation.

Building a strong, inclusive, and resilient human capital base requires prioritizing child protection as a central policy concern. Ensuring every child grows up in a safe, supportive, and nurturing environment is one of the most powerful levers for breaking intergenerational cycles of poverty and inequality—and for unlocking the full potential of future generations. Evidence shows that preventing violence alone can reduce long-term costs across healthcare, education, and justice systems, while improving outcomes that matter most for national development.[105] Evidence also indicates that implementing comprehensive deinstitutionalization and childcare reforms, alongside expanding inclusive education opportunities, can help unlock the potential of children separated from their families and placed in care. This is particularly important for children with disabilities, who are more likely to be separated from family care and placed in long-term residential or institutional settings.

5.1.3. Child Protection in Central Asia

Central Asia has a longstanding pattern of institutionalizing children, indicating the urgent need to strengthen social services that can effectively support vulnerable children and their families.[106] Currently, nearly 60,000 children aged 0–17 across the five Central Asian countries are growing up in residential care—despite well-documented evidence of the harmful and often irreversible impact of family separation and institutionalization on a child's development and well-being. This number likely represents only a fraction of the reality, as data limitations in terms of availability, consistency, and coverage make it difficult to capture the full scope of the issue.[107]

The rate of children in residential care serves as a barometer for the strength of a country's child protection system. In Central Asia, approximately 203 out of every 100,000 children live in institutional settings—nearly double the global average of 105 per 100,000—suggesting significant weaknesses in systems intended to keep families together.[108]

The consequences of family separation can be profound and lifelong. Children are often removed from their families under distressing and traumatic circumstances, which can leave both children and parents with deep emotional wounds and a lasting sense of loss and worthlessness. The psychological and social effects can persist well into adulthood.

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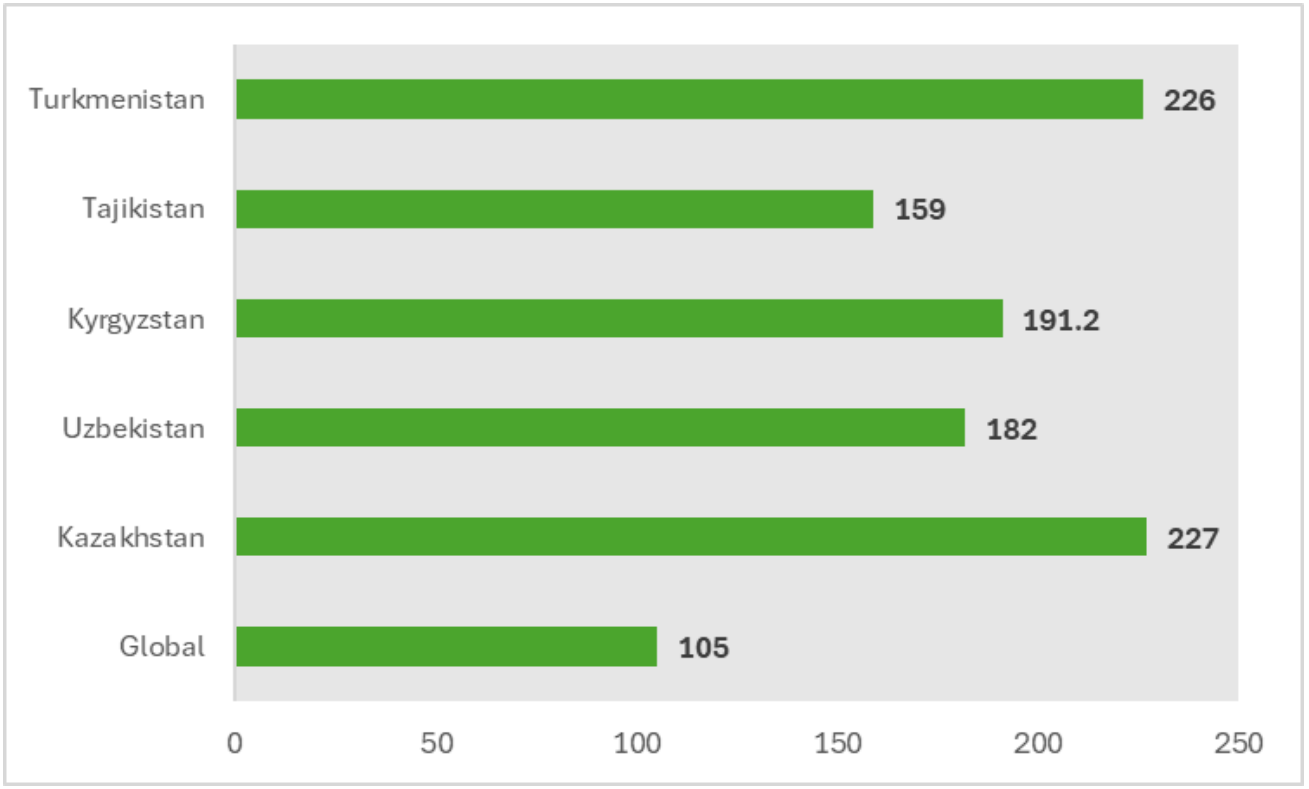
101 BetterCareNetwork (2013) Why child protection matters. Available here.
102 UNICEF (n.d) Protecting children from violence in school. Available here.
103 BetterCareNetwork (2013) Why child protection matters. Available here.
104 Gilbert, R, Widom, C., Browne, K, Fergusson, D., Webb, E. and Janson, S (2009) `Burden and consequences of child maltreatment in high income countries' The Lancet vol 373 issue 9657 pp68-81.
105 Hillis, S. et al. (2017). *The cost of violence against children: A review of economic impact studies*. Child Abuse & Neglect, 73, 22–34.
106 UNICEF (2024) Keeping families together in Central Asia. Available here.
107 Ibid
108 Ibid

Figure 17. Children in residential care (number per 100,000)



Source: *Created by Author with data from different sources*[109]

The number of children in residential facilities per 100,000 population serves as a key indicator of a country's reliance on institutional care over family- or community-based alternatives. In Central Asia, this rate is consistently and significantly higher than the global average of 105 children per 100,000. All five Central Asian countries exceed this global average benchmark, with Kazakhstan recording the highest rate at 227per 100,000, Turkmenistan following closely behind with 226 per 100,000.The rest of the region also shows elevated rates. This trend indicates a systemic over-reliance on institutional care in the region, suggesting that preventive family support services, kinship care, and community-based alternatives may be underdeveloped or underutilized. Another important point is that children with disabilities are significantly overrepresented in institutional care. In Uzbekistan, for example, they account for around 90 percent of all children living in institutional settings. This issue is critical not only from a child rights standpoint but also for human capital development, given the long-term adverse effects of institutionalization on children's well-being and future potential.

If the right investments are not made to support children in residential facilities, these figures are likely to increase over time. The data shows an urgent need for policy shifts toward strengthening family-based care systems in line with international child protection standards such as the UN Guidelines for the Alternative Care of Children.

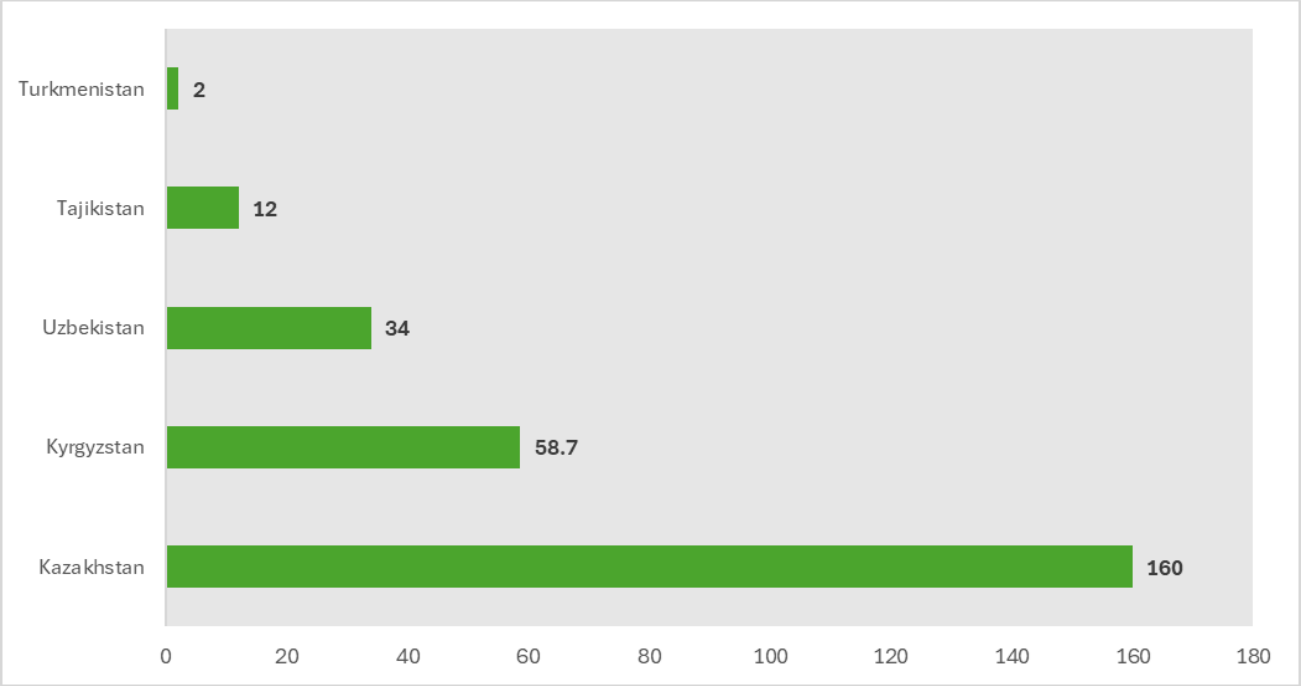
5.1.4. Social service workers

A well-trained and adequately resourced social service workforce (SSW) is critical to ensuring the protection and well-being of children, particularly those at risk of separation from families or living in

[109] Calculated using data from the following sources: UNICEF (2024) Nearly half a million children in Europe and Central Asia live in residential care facilities. Available here. 24KG (2024) Five percent of children in residential facilities of Kyrgyzstan have no parents. Available here. UNICEF (n.d) Keeping families together. Available here. UNICEF (2024) Situation Analysis of Women and Children. Available here. UZDaily (2021). UNICEF: the proportion of children living in residential institutions is twice higher in Uzbekistan compared to the global average. Available here. UNICEF (2024) Keeping families together in Central Asia. Available here. TransMonee database

vulnerable situations. For the purposes of this report, the SSW includes a diverse group of professionals engaged in paid roles across governmental sectors, working to ensure the well-being of children, youth, adults, older persons, families and communities. This excludes other health care workers such as doctors, junior and mid-level health workers, volunteers and paraprofessionals. The available data from Central Asia reveals sharp disparities and overall insufficiency in the availability of social service workers across the region.

Figure 18. Social service workforce (per 100,000 children)



Source: *Created by the Author with data from different sources*[110]

Kazakhstan stands out with 160 social service workers per 100,000 children, indicating relatively strong investment in the workforce. Uzbekistan (34) and Kyrgyzstan (58.7) show moderate levels of coverage but still fall far below regional best performer (Kazakhstan). Tajikistan (12) and Turkmenistan (2) have alarmingly low workforce densities, reflecting major capacity gaps that likely hinder access to timely and effective social services for children and families.

Without a global benchmark, it is difficult to assess these figures against a universal standard. However, if Kazakhstan, the best regional performer, is used as a benchmark, then the other four countries are falling behind. The regional disparities point to differing levels of prioritization, training infrastructure, and resourcing of the social service workforce. Countries with low ratios are likely to face weak child protection gatekeeping systems, limited case management and family reunification services and increased reliance on institutional care due to a lack of early intervention and support. This shortage is particularly concerning in light of the high rates of children in residential care across the region. Strengthening the social service workforce is therefore essential to enable a shift from institutional to family- and community-based care, in line with international standards.

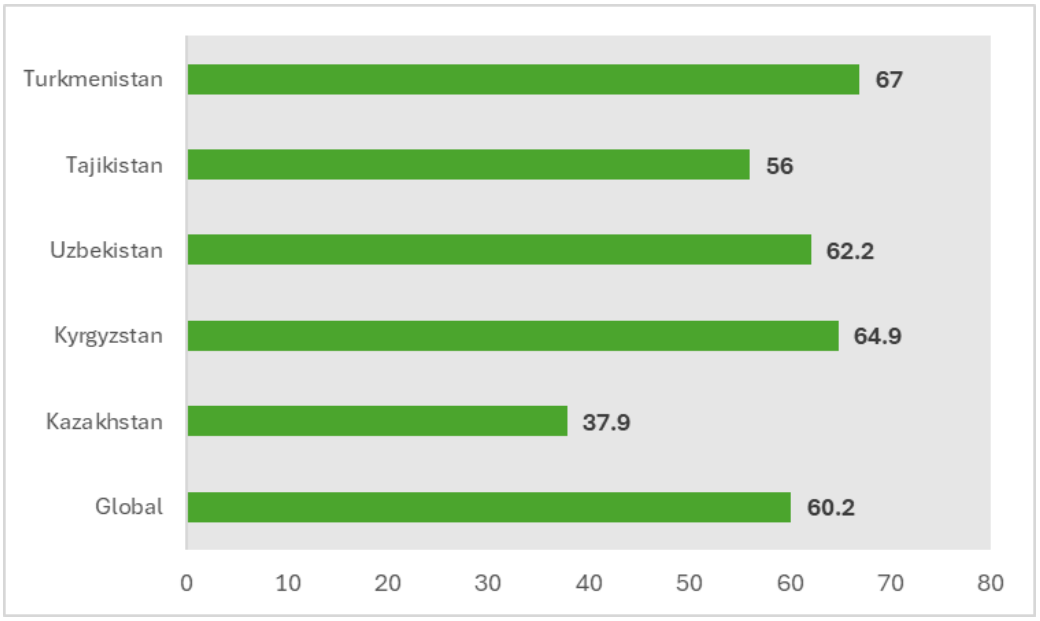
5.1.5. Violent discipline

Violent discipline, encompassing psychological aggression (such as shouting, threats, or humiliation) and physical punishment (such as hitting or slapping), remains a widespread issue affecting children

[110] Inkaraganda (2023) The status of social workers will be raised in Kazakhstan. Available here. UNICEF (2024) Social work is a driving force in solving social problems of vulnerable groups of the population. Available here. UNDP (2022) Joint Programme Final Narrative Report. Available here.

globally. According to the latest data, the global average stands at 60.2%, meaning that nearly two-thirds of children experience violent discipline at home within a one-month period.

Figure 19. Prevalence of violent discipline



Source: *Created by the Author with data from UNICEF*

In Central Asia, three out of five countries exceed the global average, although not by a significant amount. The only exceptions were Kazakhstan with 37.9% and Tajikistan with 56%. These figures suggest that violent discipline remains a normalized method of child growth in many Central Asian households, despite growing awareness of its harmful effects on child development, emotional well-being, and long-term behavior.

Kazakhstan's relatively lower rate could reflect stronger awareness campaigns, better legal protections, or more widespread adoption of positive discipline strategies. Pilot anti-bullying programs like KiVa and Dosbol LIKE have been rolled out in schools to build healthy, non-violent peer relationships, train educators, and empower children to report and confront abuse.[111] Additionally, new reporting tools for child protection have been introduced. QR codes with direct links to the 111 national contact center are displayed in schools, enabling children to reach out confidentially for help. In the first five months of 2025 alone, more than 86,000 children used this channel, with over 2,000 seeking help for violence or bullying.[112] However, even in Kazakhstan, more than a third of children are still subjected to violent discipline, signaling the need for continued efforts across the region.

5.1.6. Proposed intervention scale ups by 2050

Among various potential investment options in the child protection sector, this report prioritizes scaling up the social service workforce (SSW). This decision is grounded in three core considerations: the persistent shortage of qualified social service professionals, the transformative impact a strengthened workforce can have across multiple child protection outcomes, and the alignment of this investment with national priorities across Central Asia.

Across the region, the number of social service workers remains significantly below international benchmarks, limiting the capacity of national systems to provide effective prevention, early intervention, and response services. In some countries like Turkmenistan, the ratio of social workers to

[111] AstanaTimes (2025) Special Report: How Adults Can Support Children on Both Sides of Bullying. Available here.
[112] Timesca (2025) Kazakhstan's Domestic Violence Law Brings Progress Amid Ongoing Challenges. Available here.

children (2: 100,000) is far below what is needed to ensure timely case management, family support, and protection monitoring.

Importantly, strengthening the social service workforce is not a siloed intervention. It is a foundational investment that can help address multiple systemic child protection challenges. For example, violence prevention and response efforts are often ineffective due to a lack of trained personnel to identify, refer, and support child victims and at-risk families. Efforts to reduce reliance on residential care require robust family-based alternative care systems and community-based services, both of which depend on well-trained and adequately supported social workers. Additionally, effective implementation of child protection legislation and referral mechanisms hinges on the presence of professionals who can translate policy into practice at the local level.

This investment priority is clearly aligned with national commitments and reforms. Several Central Asian countries have outlined the need to strengthen their child protection systems by expanding and professionalizing the social service workforce. National development plans, child protection strategies, and deinstitutionalization roadmaps in countries such as Kazakhstan, Kyrgyz Republic, and Uzbekistan all recognize the central role of social workers in delivering better outcomes for children.

Given its potential to unlock broader systems change, support multi-sectoral collaboration, and contribute to long-term resilience and sustainability of child protection systems, investing in the social service workforce emerges as the most strategic and high-impact priority for the region at this time.

The priority should not only be to expand the size of the social service workforce, but to build a cadre of qualified social workers capable of effectively delivering family support, gatekeeping, and child protection services. Currently, many frontline social service providers across the region make critical decisions affecting children without the necessary professional training or supervision. A strong workforce should be anchored in child protection structures that coordinate seamlessly across sectors. This requires establishing dedicated child protection systems, supported by a continuum of care services—from primary preventive family support to statutory interventions and alternative family-based care. Within this framework, qualified social workers should serve as the core professionals responsible for case management, coordination, and service delivery, ensuring that the broader social service workforce operates cohesively and effectively to safeguard children's well-being.

Kazakhstan stands out in the Central Asia region for having a relatively well-established social service workforce, with approximately 160 trained SSWs per 100,000 children. This figure is substantially higher than in neighbouring countries, where the numbers remain critically low — just 2 in Turkmenistan, 11 in Tajikistan, 34 in Uzbekistan, and 58.7 in Kyrgyzstan. This disparity underscores the uneven development of child protection systems across the region and the urgent need for targeted investment in workforce expansion outside of Kazakhstan.

Expanding the coverage of SSWs in other Central Asia countries will help strengthen gatekeeping functions to prevent unnecessary separation, reduce reliance on institutional care, supporting family-based alternatives and reintegration of children separated from their families into their families of origin aligned with international standards. A scale up will also enable early identification and intervention in cases of violence, neglect, or exploitation, especially in underserved areas. Finally, it could support the implementation of multidisciplinary responses, working alongside health, education, and justice sectors.

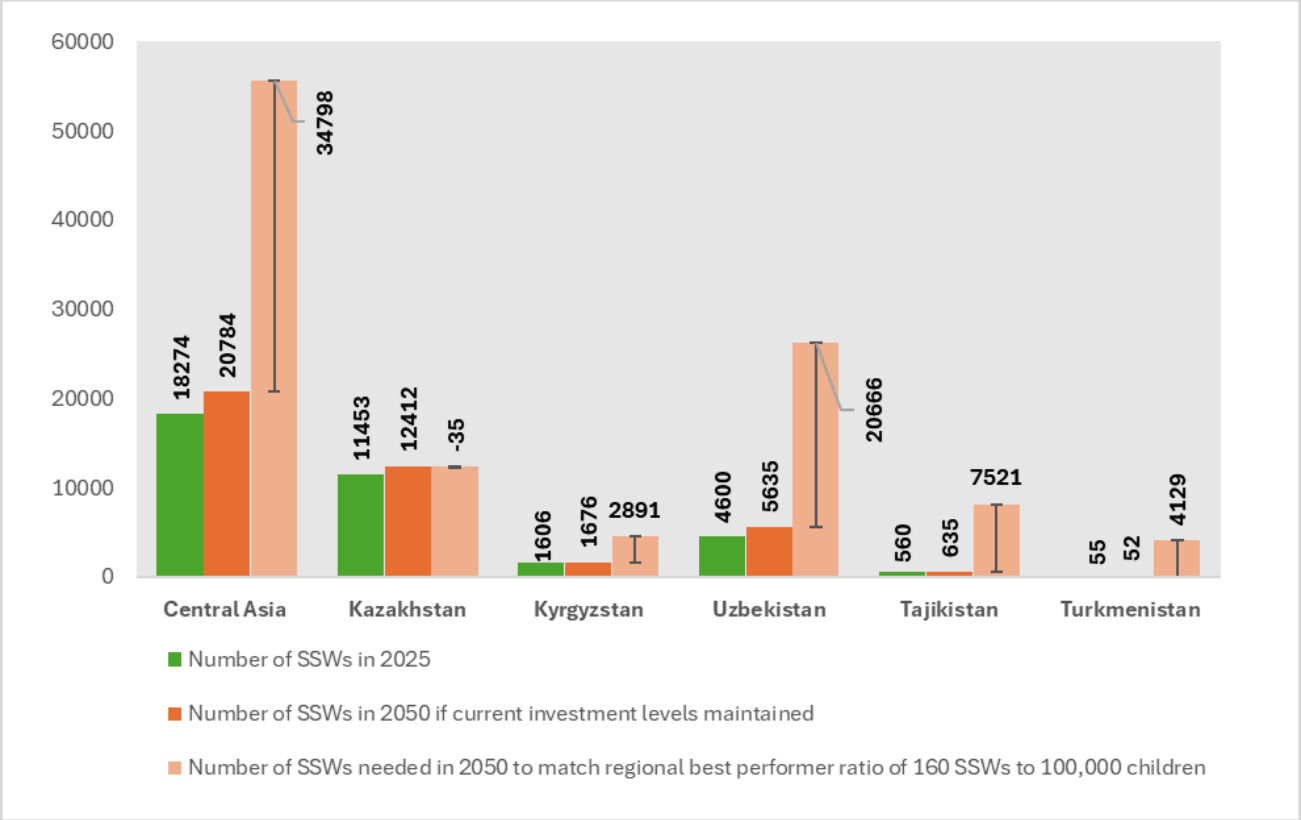
By 2050, proposed increases in SSWs are likely to consolidate a professionalized and resilient social service system capable of meeting future demographic and social challenges. This will ensure universal access to protective services, leaving no child behind regardless of location, gender, disability, or socioeconomic background. It will also embed social services more firmly within the broader social protection framework, creating synergies with poverty reduction and education initiatives.

The anticipated rise in the child population across the Central Asia region will demand a substantial scale-up in the number of social service workers (SSWs) just to maintain current levels of service. Taking into account both the projected growth in the child population and existing SSW-to-child ratios in each country, more than 2,400 additional SSW will be needed by 2050—on top of the current workforce of 17,654—to simply preserve the status quo.

However, if the goal is to improve service quality by aligning with the regional best performer benchmark—Kazakhstan's ratio of 160 SSW per 100,000 children—then the region would need to increase its SSW workforce by 35,503, more than tripling the current number of SSW.

In absolute terms, Uzbekistan will require the most significant investment, needing to recruit over 20,000 SSW by 2050 to match the best-performing country. This is followed by Tajikistan, which will need more than 7,500, Turkmenistan over 4,000, and Kyrgyzstan more than 3,400. These figures underscore the urgent need for strategic workforce planning, investment, and policy action to strengthen child protection systems across the region.

Figure 20. Number of SSW in Central Asia for each scenario by Region and Countries



Source: *Calculated with data from different sources*[113]

[113] That small negative gap for Kazakhstan reflects the fact that the 2025 ratio (social service workers to 100,000 child population) is slightly above 160 (≈160.4). Keeping this exact 2025 investment level requires about 35 more workers than meeting the rounded 160-per-100,000 minimum.

Sources: Inkaraganda (2023) The status of social workers will be raised in Kazakhstan. Available here. UNICEF (2024) Social work is a driving force in solving social problems of vulnerable groups of the population(Uzbekistan). Available here. UNDP (2022) Joint Programme Final Narrative Report. Available here.;UNICEF (2022) Evaluation of UNICEF's Protective Environment programme in Tajikistan (2016 - 2022)https://evaluationreports.unicef.org/GetDocument?documentID=16485&fileID=46527

5.1.7. Optimising the Investments

To maximize the impact of this intervention, strategic attention must be paid to how resources are mobilized and deployed. The proposed workforce expansion must be underpinned by the following principles:

Investment Efficiency

Efficiency and impact in the social care system can be achieved by shifting from institutional care to a family- and community-based model, where resources are strategically reinvested in prevention and family support. This requires reallocating financial, material, and human resources away from large-scale institutions toward a continuum of family strengthening and alternative care services that prioritize keeping children within safe and nurturing environments. For Central Asia, the cornerstone of this transformation is a qualified, well-supported social service workforce capable of playing a proactive and preventive role in the lives of children and families. The primary focus should be on developing and scaling preventive social services that identify and address risks early—long before a crisis leads to family separation. In countries such as Uzbekistan, such early intervention and family support mechanisms remain limited, indicating the urgent need for strategic investment in human capital and systems reform to make social care more responsive, efficient, and child-centered.

Use of blended training models and e-learning platforms can reduce the cost of building workforce capacity while maintaining quality standards. Instead of costly in-person workshops, a blended model can be used. Foundational knowledge (e.g., child development stages, national laws) can be delivered through a national e-learning platform, which workers can complete at their own pace. This could be followed by shorter, regional, in-person sessions focused on practical skills like counselling and crisis intervention. Kazakhstan has good practices that can extend to SSWs in the child protection sector. For example, to equip students with practical skills, the Ministry of Labour has introduced an internship feature on the Electronic Labour Exchange platform.[114] Currently, 643 courses are available through the online training portal, with 410,000 individuals having completed training.

While online and blended learning can be valuable tools for capacity building, their effectiveness is significantly higher when the social service workforce already possesses a relevant academic or vocational foundation in social work—ideally with a focus on child protection. In Uzbekistan, for instance, many social service workers come from unrelated professional backgrounds, which limits the impact of e-learning initiatives on their own. Moreover, training efforts must be reinforced through strong professional supervision and mentoring, as ongoing education alone does not automatically lead to improved quality of practice.

Finally, deploy predictive analytics to identify high-risk areas for targeted interventions, ensuring resources are focused where they are most needed. Governments in Central Asia could leverage data from current online platforms that record and analyse data known to correlate with child vulnerability (e.g., parental migration, household poverty, disability), to predict high-risk districts or even specific neighbourhoods. This allows for proactive, preventative interventions—like parenting support programs led by SSWs to be deployed before a crisis occurs, which is far more efficient than reactive responses.

Equity

Prioritize the equitable geographic distribution of social service workers, including placements in remote, rural, and marginalized communities. Kazakhstan's introduction of digital service and training platforms, as well as offline mobile applications, specifically aims to enhance outreach to rural, remote, and minority communities and ensure gender equality in social service delivery.[115] Results from

[114] Office of the Prime Minister (2025) The Year of Vocational Professions: Kazakhstan to launch a Digital Map of Enterprises to identify financial, social and labour risks. Available here.
[115] UNDP (2023) Digitalisation for sustainable development and social well-being of society. Available here.

its pilot roll-out shows that social workers are now more comfortable reaching families in rural areas.[116] Uzbekistan is expanding the accessibility of social services for all population groups, with particular emphasis on income generation and poverty reduction. Efforts are also underway to strengthen and conceptualize risk prevention services, including those addressing violence and the institutionalization of both children and adults. In addition, mobile interdisciplinary teams are being established to improve outreach and ensure that essential services reach remote and rural communities.

While Kazakhstan's progress in building a professional social service workforce is commendable, it should also be noted that the distribution of these workers may not be uniform across the country. Available evidence suggests a concentration of social services in urban centres, with limited outreach and availability in rural and remote areas.[117] The potential urban-rural gap may lead to broader challenges in ensuring equitable access to child welfare services, particularly for marginalized populations and rural families.

Ensure workforce recruitment and training is inclusive of gender and disability, both to reflect the populations served and to address underrepresentation in the current workforce. Actively recruit SSWs from ethnic minority communities to ensure services are linguistically and culturally appropriate. For example, in Tajikistan's Gorno-Badakhshan Autonomous Region (GBAO), recruiting from local Pamiri communities is crucial for building trust and effectiveness. Many Pamiris express concerns about marginalization both at the national level in Tajikistan and within the Gorno-Badakhshan region itself.[118] Therefore, it is crucial they are recognised in any workforce recruitment efforts in order to serve their community. Training curricula must include modules on gender equality, disability rights, and cultural competency.

Adapt job profiles and outreach strategies to ensure that the needs of ethnic minorities, children with disabilities, and those in informal settlements are recognized and met. For instance, mobile outreach teams could be established to serve semi-nomadic communities. Job profiles for SSWs working in areas with high rates of labour migration could include specific competencies in supporting children in transnational families.

Effectiveness

Develop national standards and competencies for social service workers to ensure consistent quality of service. For instance, Kazakhstan set forth eight-tier professional standards for social workers, required ongoing training, and introduced a central register and recognition of qualifications—ensuring consistent, accredited, and competency-based practice nationwide.[119] In Tajikistan as well, comprehensive quality standards for the provision of social services to victims of domestic violence have been established, setting clear guidelines to enhance the consistency, professionalism, and effectiveness of support services nationwide.[120] In Uzbekistan, a comprehensive Law on Social Work and accompanying regulations have been developed to strengthen the national social work system. These instruments define educational and qualification requirements, promote favorable working conditions, and establish clear career pathways for social workers. They also set out safety protocols and frameworks for effective collaboration between social workers and professionals across other sectors. Furthermore, a general professional standard has been introduced and is now being implemented within the country's social protection system.

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[116] Ibid
[117] Human Rights Watch (2022) Kazakhstan: Families Struggle to Enjoy Basic Rights. Available here.
[118] Minority Rights Group (n.d) Pamiris in Tajikistan. Available here.
[119] Office of Prime Minister (2024) Kazakhstan strengthens requirements for professional training of social workers. Available here.
[120] UNWomen (2018) National Review of the Republic of Tajikistan on the Implementation of the Beijing Declaration and Platform for Action. https://www.unwomen.org/sites/default/files/Headquarters/Attachments/Sections/CSW/64/National-reviews/Tajikistan_English.pdf

Create career pathways and invest in ongoing professional development and supervision, boosting worker retention and motivation. The factors contributing to social workers leaving their roles are well documented — including heavy caseloads, limited resources, and burnout.[121] Yet, it is equally clear that many social workers remain in the profession, thrive, and build long, fulfilling careers.[122] While retaining social workers continues to be a challenge for many employers, organizations can improve retention by strengthening the 'pull factors' — elements that motivate social workers to stay.[123] These include fostering a positive organizational culture, enhancing peer and team support, and offering continuous professional development (CPD) opportunities that are aligned with the specific career stages of social workers.

Integrate SSWs into multidisciplinary teams (e.g., schools, clinics, police) to enhance case coordination and holistic child protection responses. In Kazakhstan, Inter-agency cooperation protocols between primary health care (PHC) centres, social services, early childhood education, and other relevant institutions help ensure clear communication, shared access to information on vulnerable families, and efficient referral and service coordination.[124] These collaborative frameworks significantly enhance the ability of PHC-based social workers to provide timely and effective support to families in need.

Climate-Sensitive Adaptations

Embed climate-sensitive planning into workforce deployment—e.g., in disaster-prone areas, train SSWs in child protection in emergencies. Central Asia is a climate change hotspot, facing threats from melting glaciers, floods, mudslides (especially in Tajikistan and Kyrgyzstan), and desertification and drought (especially in Uzbekistan and Turkmenistan). These events increase child protection risks and children face a heightened risk of injury, illness, or even death from climate-related impacts such as infectious diseases or extreme heat.[125] These threats also endanger their physical health and hinder their mental and emotional development.[126] Social work training curricula would benefit from including a mandatory module on Child Protection in Emergencies (CPiE), with specific scenarios relevant to the local context. It is not clear if this is currently the case for training of SSWs in Central Asia. A strong example of this is the Child Protection in Emergencies Professional Development Programme, developed by Save the Children.[127] It is designed to build the skills, knowledge, and behaviours essential for effective child protection in emergency contexts. The programme equips professionals from international and national NGOs, as well as government agencies, to enhance their capacity to respond to both ongoing crises and sudden-onset emergencies.

Promote eco-friendly practices in service delivery, such as low-carbon travel solutions for outreach and use of energy-efficient infrastructure for community centers. There are currently limited examples of best practice on this approach. However, promoting low-carbon solutions for service delivery could involve providing SSWs in urban areas with public transport passes, encouraging the consolidation of trips to remote areas to save fuel, or equipping new community service centres with energy-efficient features like solar panels and insulation.

Increasing the social service workforce coverage across Central Asia is not merely a technical adjustment—it is a strategic investment in the region's social infrastructure. With the right mix of innovation, equity-driven planning, and quality assurance, this intervention has the potential to transform the child protection system and contribute to broader national development goals. Reaching high levels of SSW coverage, as demonstrated in Kazakhstan, will depend on sustained

[121] Community Care (2025) A new approach to supporting and retaining social workers. Available here.
[122] Ibid
[123] Cook, L., Carder, S. and Zschlomler, D. (2022). Retaining and supporting experienced social workers in child protection: Research Briefing. UEA: Centre for Research on Children and Families. Available here.
[124] Nurturing Care (n.d) Kazakhstan: Cooperation Between Sectors. Available here.
[125] UNICEF (2024) How climate change is affecting a nation of children. Available here.
[126] Ibid
[127] Save the Children (n.d) Child Protection in Emergencies Professional Development Programme. Available here.

political will, strong cross-sector collaboration, and active community involvement—but the long-term impact on children and society is significant.

5.2. Social Protection

5.2.1. Introduction to the Sector

Social protection encompasses a broad range of policies and programs designed to support individuals and households in managing risks, reducing poverty, and promoting inclusion. It includes cash transfers, child grants, social health insurance, school meals, and skills development programs, among others. These instruments help families meet basic needs while connecting them to essential services such as healthcare, nutrition, and education, ensuring that every child has a fair start in life. An effective social protection system integrates these various components to meet diverse needs across all age groups and demographics.[128] Adopting a life-course approach ensures coherence and continuity of support, particularly for child-sensitive social protection that addresses children's specific needs while recognizing their interdependence with adults.

Social protection serves a number of functions[129] including: reducing poverty and inequality by providing income support and ensuring access to essential services; promoting social inclusion by empowering marginalized groups—such as women, persons with disabilities, and low-income households—to participate fully in society; and managing risks faced by individuals and communities, including those arising from unemployment, illness, old age, or loss of income. Increasingly, social protection systems also play a critical role in helping societies adapt to novel risks such as pandemics, climate change, and economic shocks. By addressing not only financial barriers but also informational and skills-related constraints, social protection enhances resilience, facilitates transitions across life stages, and supports access to sustainable livelihoods.[130]

Social protection is fundamental to human capital development and unlocking the demographic dividend.[131] By improving access to health, nutrition, education, and economic opportunities, it enables individuals to realize their potential and contribute productively to economic and social development. These systems disrupt intergenerational cycles of poverty and deprivation, fostering inclusive growth through improved health and education outcomes, enhanced skills development, and increased employability.[132] Social protection also strengthens pathways to a demographic dividend by empowering women and girls. For example, cash transfers have been shown to increase girls' school attendance, delay early marriage and adolescent pregnancy, and enhance female workforce participation—all of which contribute to reduced fertility rates and lower dependency ratios.[133]

Furthermore, programs such as social health insurance and cash transfers reduce child mortality by alleviating poverty, improving nutrition, and ensuring equitable access to healthcare.[134] Lower child mortality rates are foundational to achieving a demographic dividend, as they increase the proportion of working-age individuals relative to dependents. In early childhood, social protection enables critical investments—such as better diets and healthcare—that prevent stunting and enhance cognitive

[128] UNICEF (2019) UNICEF's Global Social Protection Programme Framework. Available here.
[129] UNICEF (n.d) Social Protection. Available here
[130] WorldBank (n.d) Social Protection and Labor. Available here.
[131] DFAT (2014)Social protection and growth: Research synthesis. Available here.
[132] WorldBank (n.d) Social Protection and Labor. Available here.
[133] Sandøy, I. F., Mudenda, M., Zulu, J., Munsaka, E., Blystad, A., Makasa, M. C., ... & Musonda, P. (2016). Effectiveness of a girls' empowerment programme on early childbearing, marriage and school dropout among adolescent girls in rural Zambia: study protocol for a cluster randomized trial. Trials, 17(1), 588.
[134] Hypher, N. (2011). The role of social protection in achieving equitable reduction of child mortality. In IDS Conference on 'Social Protection and Social Justice'April (pp. 13-15).

development. Non-stunted children are more likely to excel in school and become productive adults, strengthening the future workforce and driving long-term economic transformation.

5.2.2. Social Protection in Central Asia

Poverty remains a pressing concern across Central Asia, though the extent and severity vary significantly by country. At the international poverty line of $3.00 per day (2021 PPP), Kazakhstan reports virtually no poverty (0%), highlighting its relatively stronger economic position in the region.[135] In contrast, Kyrgyzstan and Uzbekistan each report poverty rates of 2.7%, while Tajikistan stands higher at 6.1%. No comparable data are available for Turkmenistan.[136]

When national poverty lines are assessed, Kyrgyzstan records the highest poverty rate at 25.7%, suggesting that a significant portion of its population remains vulnerable and unable to meet basic needs.[137] Tajikistan also reports a high national poverty rate at 19.8%, consistent with its performance on the international threshold.[138] Uzbekistan recorded 8.9% of its population under the national poverty line, while Kazakhstan outperforms others at 5%—though still reflecting pockets of economic vulnerability. Turkmenistan remains a major data gap in the region, with no recent publicly available figures on poverty.[139]

Another critical dimension of poverty in Central Asia is food poverty, particularly among children. Food insecurity undermines children's health and development across physical, cognitive, and socio-emotional domains.[140] Adequate nutrition is vital for neural development and central nervous system functioning, most critically between 6 months and 3 years of age, a period of rapid brain growth.[141] Nutritional deficiencies during this window can have lasting consequences: for instance, iron deficiency anemia in infancy is linked to delayed motor skills, impaired cognitive performance, and social–emotional difficulties that may persist into later childhood.[142] The prevalence of severe and moderate child food poverty remains alarmingly high in several countries across the region. Tajikistan records the highest rates, with 34% of children in severe food poverty and 44% in moderate food poverty.[143] In Kyrgyzstan, the figures stand at 12% and 35%, followed by Uzbekistan at 11% and 33%, and Turkmenistan at 4% and 27%, respectively.[144] These patterns underscore the urgent need for targeted nutrition and social protection interventions to prevent long-term developmental losses among the most vulnerable children.

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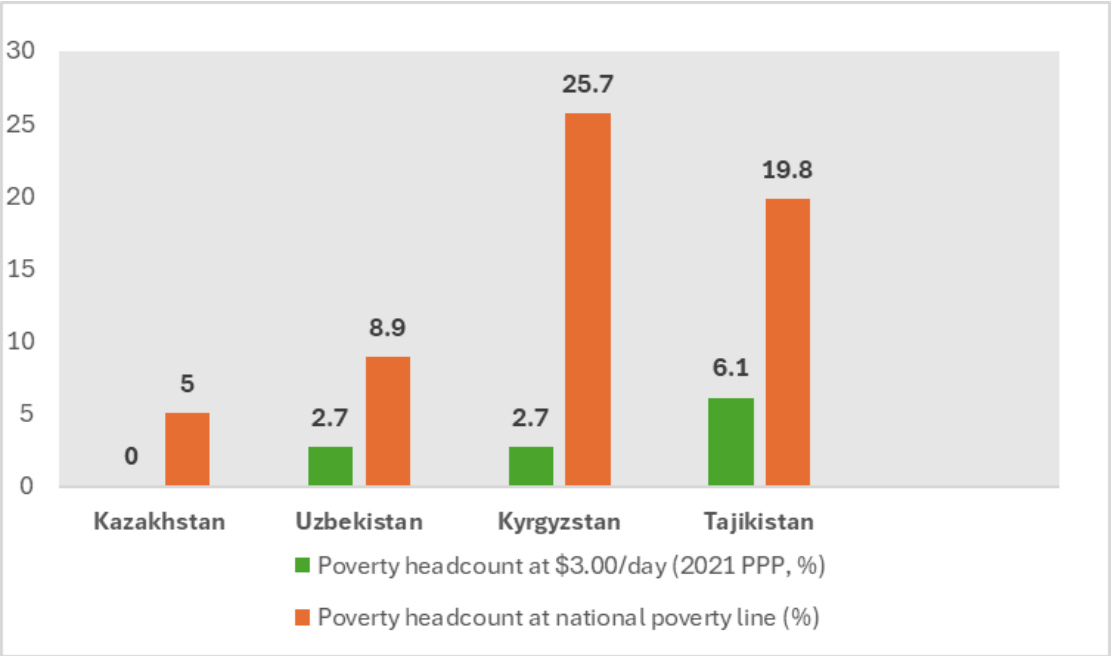
[135] World Bank (n.d) Poverty headcount ratio at national poverty lines (% of population). Available here.
[136] Ibid
[137] Ibid
[138] Ibid
[139] Ibid
[140] Casey, E. G., & Winsler, A. (2025). Impacts of Food Insecurity on Child Development: Strengthening the Role of Childcare. Nutrients, 17(15), 2427.
[141] Thomas, D. G., Grant, S. L., & Aubuchon-Endsley, N. L. (2009). The role of iron in neurocognitive development. Developmental neuropsychology, 34(2), 196-222.
[142] Lozoff, B., Beard, J., Connor, J., Felt, B., Georgieff, M., & Schallert, T. (2006). Long-lasting neural and behavioral effects of iron deficiency in infancy. Nutrition reviews, 64(suppl_2), S34-S43.
[143] UNICEF (2024) Child Food Poverty. https://www.unicef.org/eap/media/15976/file/CNR%202024%20-%20Child%20Food%20Poverty%20-%20Full%20report%20-%20Final.pdf.pdf
[144] Ibid

Figure 21. Poverty levels in Central Asia



Source: *World Bank data*[145]

Social protection systems across Central Asia are relatively well established in design but differ widely in terms of coverage, adequacy, and effectiveness. While all countries have some form of social assistance, pensions, and family benefits, the depth of coverage and quality of targeting vary substantially, often reflecting broader economic and administrative capacities.

Kazakhstan has one of the region's most mature social protection systems, encompassing a wide range of social assistance and insurance schemes for low-income groups. Despite this, effectiveness remains constrained by limited targeting accuracy, low benefit adequacy, and weak monitoring and evaluation mechanisms. Most social assistance programs are categorical, supporting specific groups identified as the most vulnerable.[146] This approach has influenced targeting resulting in only 31% of benefits reaching the poorest 10% of the population.[147] Although coverage expanded significantly in recent years—with 2.1 million beneficiaries, including 1.3 million children—this rapid growth created fiscal and implementation pressures.[148] The system's strong institutional base is offset by the need for reforms to improve equity, targeting efficiency, and benefit adequacy.

Kyrgyzstan's social protection framework combines cash transfers, pensions, and in-kind support, with 64% of households reporting receipt of some form of benefit.[149] Key programs include the *Suyunchu* (birth grant), monthly allowances for families with children, and social pensions. However, coverage among children (percentage of children under age 18 living in households that received any social transfers or benefits in the last 3 months) remains moderate (50.6%), with most benefits concentrated among pensioners rather than poor families with children.[150] For instance, the percentage of children living in households that received monthly allowance for low income families

[145] No data available for Turkmenistan
[146] World Bank (2024) Kazakhstan Poverty and Equity Assessment. https://openknowledge.worldbank.org/entities/publication/9072f72e-e54d-4b7f-ae23-d75cf89d1814
[147] Ibid
[148] UNICEF (2020)Improving Access to Social Protection and Cash Plus Services for Low-income Families with Children. http://unicef.org/eca/media/14326/file
[149] UNICEF (2023) Multiple Indicator Cluster Survey 2023. https://mics.unicef.org/sites/mics/files/2024-10/Kyrgyzstan%202023%20MICS_English.pdf
[150] Ibid

with children in the last 3 months was 5.7%, compared to the percentage of children living in households that received any retirement pension was 34.6%.[151]

Turkmenistan provides a wide range of universal and categorical benefits, including lump-sum payments at childbirth, state allowances for children and persons with disabilities, and retirement pensions.[152] According to the Multiple Indicator Cluster Survey (MICS) 2019, about 67% of households received at least one form of benefit in the preceding three months, and 68% of children lived in households benefiting from transfers. The State Allowance for Children had the highest reach (46% of children). Coverage is relatively broader for children in Turkmenistan than other countries in the region.

Uzbekistan operates a diverse system of benefits and allowances covering families with children, persons with disabilities, and unemployed or low-income households.[153] Awareness and participation are high—88% of respondents reported receiving some form of social support, and 51% of children lived in beneficiary households. However, individual program coverage remains limited: only 9.7% of children benefited from social assistance to low-income families, 5.5% from childbirth grants, and 3.4% from childcare allowances.[154]

Tajikistan's system has very low coverage and modest benefit levels. The Targeted Social Assistance (TSA) program—covering only 14% of the population in 40 out of 68 districts—provides just USD 40 per year per household, far below subsistence needs.[155] Social insurance programmes in the country include temporary disability benefits, sickness benefits, family and child benefits, maternity benefits, monthly state benefits for children living with HIV/AIDS, funeral grants for members of poor families, and unemployment benefits.[156] The total value of social insurance benefits—including family, child, and maternity benefits—declined significantly between 2015 and 2019. Specifically, temporary disability, sickness, and maternity benefits fell by 57.7%, while family and child benefits dropped by 22.1%.[157] Although the number of beneficiaries also decreased during this period, this trend contrasts with broader labor market and demographic dynamics, which would typically indicate a gradual increase in demand for such benefits. This suggests underlying challenges or funding constraints within the social protection system.

5.2.3. Proposed intervention scale ups by 2050

The countries of Central Asia are at various stages of a demographic transition, presenting a window of opportunity to harness a demographic dividend. However, this dividend is not guaranteed. It can only be realized if today's children grow into a healthy, educated, and productive workforce. The proposed package of Universal Child Benefits (UCB), Maternity Benefits[158] (MB), and Child Disability Benefits (CDB) will ensure this happens since it builds high-quality human capital from birth. The Maternity Benefit ensures mothers and newborns get a healthy start, which is critical for brain development. The Universal Child Benefit is a powerful tool against stunting and malnutrition, which can cause

[151] Ibid

[152] UNICEF (2019) Multiple Indicator Cluster Survey. https://mics.unicef.org/sites/mics/files/Turkmenistan%202019%20MICS%20SFR_English.pdf

[153] UNICEF (2022) 2021-2022 Multiple Indicator Cluster Survey. https://mics.unicef.org/sites/mics/files/Uzbekistan%202021-22%20MICS%20SFR_English%20%5B2023-02-23%5D.pdf

[154] Ibid

[155] UNICEF (2020) Adapting the Social Protection System to be Shock-Responsive. https://www.unicef.org/eca/media/14366/file

[156] ILO (2023) Public Expenditure and Institutional Review of the Social Protection Sector in Tajikistan. https://www.ilo.org/sites/default/files/wcmsp5/groups/public/%40europe/%40ro-geneva/%40sro-moscow/documents/publication/wcms_866740.pdf

[157] Ibid

[158] Maternity benefits in Central Asia is a one off lump sum payment or birth grant for each new born child. The birth grant provides the basis for the costing model in the report but will be replaced by a proper maternity benefit that is provided for the first 140 days after birth - as per the ILO Convention 183

irreversible damage to a child's cognitive potential. By providing families with a basic income floor, the UCB also reduces the chances of poor school attendance and attainment. The Child Disability Benefit ensures this investment is inclusive, providing children with disabilities the support they need to access education and health services, allowing the entire future workforce to reach its potential.

While maternity and child disability benefits are already universal in Kazakhstan, expanding the UCB from the current 54 per cent coverage to all children by 2035 is the crucial next step. This move would shift the system from a poverty-targeting model, which often misses vulnerable families just above the poverty line, to a universal one that acknowledges that all families face increased costs when raising children. It ensures that every child, regardless of their parents' or guardians' income, has the foundational resources needed to thrive, contributing to a more skilled and productive future workforce.

Uzbekistan shows strong progress on maternity benefits (100%), but has gaps in UCB (29%) and especially CDB (45%) coverage. Scaling these to 100% by 2035 to ensure that no child is left behind. With one of the region's larger populations, expanding UCB and CDB will significantly reduce inequality, promote inclusion, and support the health and development of children, especially in low-income and rural communities. These investments are critical for boosting the future workforce and ensuring long-term inclusive growth.

Kyrgyzstan maintains universal coverage of maternity and child disability benefits, which is commendable. However, UCB coverage is just 16%, leaving most children without consistent support. With a national poverty rate of 25.7%, scaling UCB to 100% would provide families with predictable income, help smooth consumption during economic shocks, and allow for greater investments in health and education—core elements for achieving a demographic dividend.

Tajikistan has achieved 100% maternity benefit coverage for those in formal employment, but UCB (16%) and CDB (54%) remain limited in reach. These shortfalls are particularly concerning in a country where 13.3% of the population lives under the international poverty line. Scaling UCB and CDB to 100% by 2035 will ensure broader protection for children and those with disabilities, fostering an inclusive environment where all children have equal chances to thrive.

Turkmenistan has a relatively high coverage of maternity benefits (100%) and CDB (85%), but UCB coverage is only 15%. Improving UCB coverage would ensure that every child—regardless of socioeconomic background—receives early and consistent support.

On adequacy of benefits[159] for social protection, it is proposed that an increase of each benefit (as a percentage of GDP) only happens when the current level falls below the target threshold; otherwise, the existing adequacy should be maintained. The table below shows the implications of this proposal for each country.

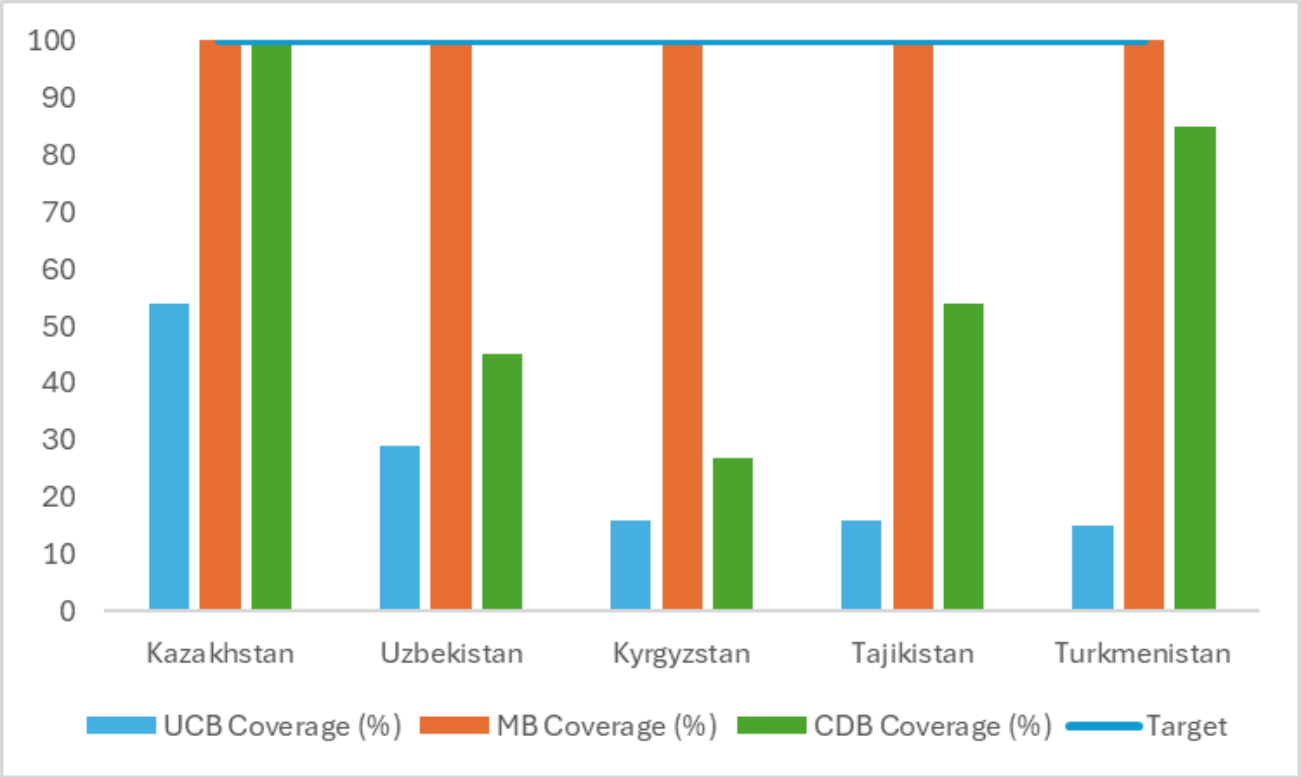
Table 9. Adequacy of benefits

Country	**Adequacy**
Universal Child Benefits (UCB)	Child benefit adequacy is only increased in Kazakhstan and remains the same for the other 4 countries in the region.
Maternity Benefit (MB)	Maternity benefit adequacy increases in all 5 countries. That is, from the current birth grant.

[159] More guidance on increasing adequacy benefits is provided in the costing model

Child Disability Benefits (CDB)	Disability benefits adequacy increased in Kazakhstan and Tajikistan only but remains the same for the other 3 countries in the region

Figure 22. Coverage levels of Universal Child Benefits (UCB), Maternity Benefits (MB), and Child Disability Benefits (CDB) in Central Asia



Source: *ILOSTATs, Statistics on social protection*

5.2.4. Optimising the Invetments

The following principles must be embedded into the design and rollout of these interventions to ensure they are efficient, equitable, effective, and considerate of environmental risk.

Investment Efficiency

In many parts of Central Asia, social protection processes still rely on manual, paper-based systems. In the Kyrgyz Republic, for example, potential Monthly Benefit for Poor Families with children (MBPF) beneficiaries face high application costs, often having to gather multiple documents and travel to rayon (district) centres—an especially heavy burden for those with the lowest incomes.[160] The lack of electronic document sharing between government agencies further increases costs, while the complexity of procedures and the number of actors involved create opportunities for corruption.[161]

To improve efficiency and access, Central Asian countries should invest in integrated digital social protection systems - creating a seamless digital ecosystem anchored by a unified social registry of households, which serves as the single source of data for all social programmes. Linking the registry to other government databases—such as civil registration for births and Ministry of Health records for disability status—will improve data interoperability. Direct payment delivery to bank accounts or

[160] OECD (2018), Social Protection System Review of Kyrgyzstan. Available here.
[161] Ibid

mobile wallets can also reduce barriers for beneficiaries. Uzbekistan's development of a "Single Register for Social Protection" is a promising step, and fully leveraging it for all child-focused benefits could significantly improve access and transparency.[162]

Adopting a universal approach to benefits is one of the most effective strategies for achieving key dimensions of a strong social protection system: it reduces exclusion errors (enhancing effectiveness), minimizes stigma (promoting equity), simplifies administration (improving efficiency), and allows for rapid scalability in response to covariate shocks (strengthening system resilience).

Equity

Equitable distribution means making investments that actively remove barriers preventing marginalized groups from accessing their rights and benefits; these barriers are often compounded when vulnerabilities intersect, such as with gender and disability. Disability benefits, for example, are often underutilized due to stigma, limited outreach, and the inaccessibility of government offices.[163] These barriers are not gender-neutral. The administrative and physical burden of navigating the system, like traveling to government offices and completing paperwork, disproportionately falls on women, who are typically the primary caregivers.
In Uzbekistan, despite significant investment in disability benefits, many people with disabilities—especially children—do not receive them.[164] The Child Disability Benefit, a vital programme for the country's most vulnerable children, reaches only 52 per cent of those with severe disabilities, even though it is universally available. This gap shows that many families face persistent access barriers. Proactive identification and simplified processes can help.

Effectiveness

Effectiveness in social protection means ensuring an intervention achieves its ultimate goals, such as improved child well-being, not just that it's delivered. This requires a dual focus. First, improving the adequacy of the benefit amount is essential. A cash transfer that is too small to cover basic subsistence needs or make a meaningful difference in a family's budget cannot, by itself, be expected to produce significant results. Furthermore, even an adequate cash benefit may not be enough on its own to drive lasting behavioral and social change. For example, simply providing sufficient cash for children will not automatically reduce stunting if families do not also have access to the necessary health services, nutrition knowledge, or affordable, nutritious food. Likewise, it won't reduce the high prevalence of violent discipline if caregivers lack access to parenting support and mental health services. The "Cash Plus" approach is crucial here. Linking adequate cash transfers with complementary interventions—such as health, education, or social-emotional support—is what can significantly amplify impact and achieve real, sustainable change.

Climate Sensitive Adaptations

Climate change is a significant barrier to economic development in Central Asia.[165] The region's semi-arid to arid climate makes it highly prone to droughts, and shifting weather patterns have intensified these vulnerabilities. Human-induced climate change is placing increasing strain on vital natural resources—particularly access to clean water and air. Urbanization, water scarcity, air pollution, extreme weather events, deforestation, habitat loss, desertification, rising electricity demand, greenhouse gas emissions, and economic fragility are just some of the many challenges linked to

[162] UNICEF (2021) Joint UN-Uzbekistan Achievements in Strengthening the Social Protection System Discussed. Available here.
[163] UNFPA (2023) Disability Inclusive Development with Men and Boys. Available here.
[164] UNICEF (2019) Building a National Social Protection System fit for Uzbekistan's Children and Youth. Available here.
[165] ERI (n.d) Impacts of Climate Change in Central Asia. Available here.

climate change. A country's ability to build strong human capital can be undermined by recurrent and compounding shocks. To avoid losing development gains, it is essential to implement mechanisms that safeguard these critical investments in its people. **To address these growing risks, social protection systems must be designed to withstand and respond to the increasing frequency, magnitude and severity of climate-related shocks.** Adaptive Social Protection (ASP) integrates social protection, disaster risk management (DRM), and climate adaptation to build resilience, reduce vulnerability, and mitigate the adverse effects of shocks.[166] This approach ensures social protection systems remain flexible and responsive to the evolving needs of populations most affected by climate change. When implemented effectively, ASP prevents households from resorting to harmful coping strategies, enabling faster recovery and stronger community resilience.[167]

For Central Asia, this means integrating "emergency modality" operating procedures into the design, rules, and operations of social protection programs, allowing them to scale quickly when needed.[168] In countries without a dedicated ASP national policy framework, adoption is essential. This would strengthen institutional coordination between the social protection and DRM sectors, local governments, civil society organizations (CSOs), and development partners.[169]

Enhancing data collection and management, improving information systems, and expanding digital payment delivery—particularly to rural and disaster-prone areas—are also critical to ensuring timely support after disasters.[170]

Kyrgyz Republic, Tajikistan, and Uzbekistan show emerging ASP capacity, but targeted improvements are needed.[171] These include clarifying the role of the social protection sector in climate response, strengthening coordination mechanisms, enhancing data interoperability, and developing risk financing strategies. Tajikistan and the Kyrgyz Republic already have strong foundations in place through their social registry and payment systems, which can be further leveraged to build more adaptive and resilient social protection systems.[172] To build systemic resilience against climate shocks, Central Asian countries should prioritize a progressive scale-up of social protection benefits toward universalism, targeting the most climate-vulnerable regions first. This strategy shifts the model from a reactive to a proactive footing, creating an adaptive buffer against crises.

5.3. Education

5.3.1. Introduction to the Sector

Quality and Inclusive education is a cornerstone of human capital development, encompassing early childhood education (ECE), primary and secondary schooling, and higher education. Its components range from pre-primary programs that lay cognitive and social foundations, to quality primary and secondary schooling that builds literacy, numeracy, and critical skills. A well-functioning education system also includes trained teachers, adequate infrastructure, and curricula that equip students for the modern economy. Education's overall importance for human capital is paramount: it raises future productivity and earnings, improves health outcomes, and fosters civic participation.[173] Empirical evidence shows that investments in a full cycle of quality education from early learning

166 GFDRR (2023) Advancing Adaptive Social Protection in Central Asia. Available here.
167 Ibid
168 Ibid
169 Ibid
170 Ibid
171 Ibid
172 Ibid
173 World Bank. (2023, February 23). *Tajikistan's Education Outcomes to Improve with Support from a New World Bank Project*. The World Bank. Available here.

through secondary and tertiary levels yield substantial public returns over time, as higher learning outcomes are strongly linked to increased wages, productivity, and overall GDP growth.[174]

In Central Asia, where over half the population is under 30, strengthening education systems to ensure quality and inclusive learning is vital to harness the "demographic dividend" of a large working-age cohort. The World Bank's Human Capital Index (HCI) shows that children in Central Asia will only be 50–60% as productive as they could be with complete education and full health.[175] This underscores that improving education outcomes from expanding access to early learning to enhancing teaching quality supported by adequate and efficient financing, is critical for the region's human capital development.

5.3.2. Education in Central Asia

Central Asia's education systems are facing a learning crisis rather than an access crisis. While enrolment is relatively high, recent UIS (2023) data reveal persistent inequities—particularly at the secondary level—where out-of-school rates remain substantial. At the upper secondary level, Kazakhstan performs notably better, with around 10% of students out of school, whereas all other Central Asian countries have rates closer to 20%[176]. At the primary level, Kyrgyzstan and Uzbekistan perform better, with out-of-school rates of 0.5% and 2.2% respectively,[177] but challenges persist for the most disadvantaged children, especially those in rural and low-income communities. Access alone, however, masks the depth of the learning problem. Across Central Asia, too many students complete schooling without mastering foundational skills in literacy and numeracy. At the end of primary education, only 56% of students in Kazakhstan and 35% in Uzbekistan achieve minimum proficiency in mathematics, and by the end of lower secondary, these figures drop to 50% and 19%, respectively—despite both countries maintaining very high net enrolment rates. In reading, proficiency levels are similarly low, with only 36% of students in Kazakhstan and 14% in Uzbekistan reaching the minimum benchmark by the end of lower secondary. These findings underscore a systemic learning crisis—high enrolment but low learning—which limits young people's productivity and the region's ability to harness its demographic dividend**.**

Early childhood education (ECE) remains a major gap in Central Asia's education system, limiting children's preparedness for school. Pre-primary enrolment is improving but remains far from universal. In Kazakhstan, about 68.7% of children aged 39–56 months attend early education[178]. Uzbekistan has seen one of the fastest global expansions, with enrolment increasing from under 30% in 2017 to over 75% in 2024, now covering more than two million preschool-age children[179]. In Kyrgyzstan, preschool enrollment is 43%[180], while Tajikistan remains the lowest at 15–17%[181],[182]. These disparities mean millions of children enter Grade 1 without the cognitive, social, and emotional

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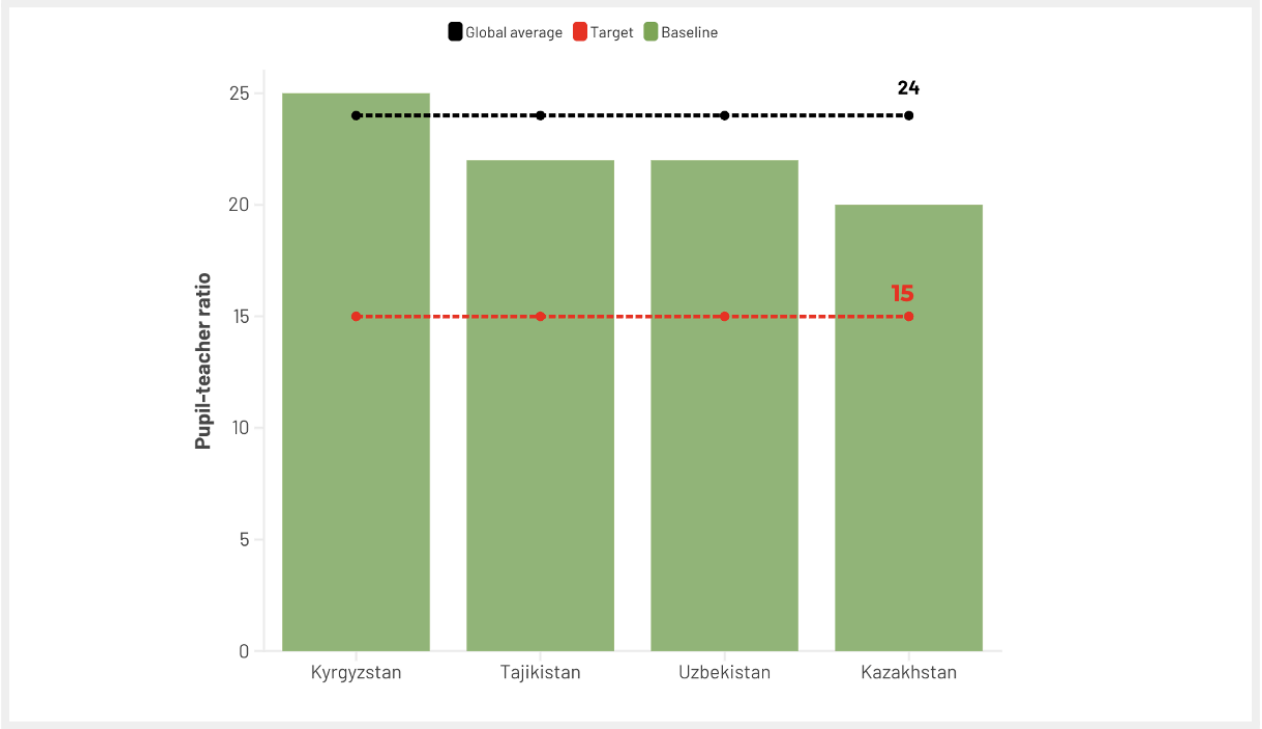
[174] Ibid
[175] Ibid
[176] UIS. (n.d.). *Out-of-school children and youth by level of education and by sex* [Data set]. UNESCO Institute for Statistics. https://databrowser.uis.unesco.org/
[177] Ibid
[178] Bureau of National Statistics & UNICEF Kazakhstan. (2024). *Early Childhood Development in Kazakhstan: Snapshot of the MICS 2024 results* [PDF]. https://stat.gov.kz/upload/medialibrary/d0b/a2n1qhvdim21apdbdodzg7mmixly8vhh/Early%20Childhood%20Development.pdf
[179] UNICEF Uzbekistan. (2024). *Situation analysis of children and adolescents in Uzbekistan* [PDF]. https://www.unicef.org/uzbekistan/en/media/6731/file/SitAnen.pdf.pdf
[180] UNESCO Institute for Statistics. (2025). *Total net enrolment rate, by level of education* [Data set]. https://databrowser.uis.unesco.org/view
[181] World Bank. (2019, May 17). *Early Childhood Development Project to build Tajikistan's Human Capital (Project P169168) – Project Information Document (Concept Stage).* https://documents1.worldbank.org/curated/en/204621560180217395/pdf/Concept-Project-Information-Document-PID-Early-Childhood-Development-Project-to-build-Tajikistan-s-Human-Capital-P169168.pdf
[182] UNICEF Tajikistan. (n.d.). *Access to education*. https://www.unicef.org/tajikistan/access-education

foundations they need to succeed. Expanding access to quality early learning—especially in rural and low-income areas—should therefore be a central priority for governments and development partners.

Teacher and classroom conditions are also uneven, reflecting deeper systemic inequities. Pupil-teacher ratios range from about 17.7 in Turkmenistan[183] to 25 in Kyrgyzstan[184], but the real challenge lies in the unequal distribution of qualified teachers and the poor condition of learning environments. Many rural schools operate with outdated infrastructure, limited learning materials, and inadequate WASH facilities, which directly hinder attendance, concentration, and learning outcomes—particularly for girls and children with disabilities. Evidence from global experience suggests that simply reducing class sizes is less cost-effective than improving teaching quality and school environments. Central Asia therefore needs sustained investment in teacher training, better deployment incentives for remote postings, and continuous professional development to strengthen classroom instruction and raise learning standards.

Figure 23. Pupil-teacher ratio, primary school



Without significant improvements in education quality across all levels and access to early learning, Central Asian countries risk missing out on the full benefits of their demographic dividend. Currently, despite high enrollment rates, too many students are completing school without strong foundational skills and needed competencies for the 21st century due to the quality issues outlined above. If the status quo persists, projections indicate that Central Asia's education indicators will improve only gradually under a "business-as-usual" trajectory and will remain below the levels needed to fully leverage the demographic opportunity. In other words, a large youth population alone does not guarantee economic gains – it must be matched with better learning outcomes and human capital development. To truly capitalize on their demographic dividend, Central Asian nations need to accelerate education reforms and investments focused on learning outcomes rather than just years in school. This includes measures to boost learning at all levels: enhancing teacher training and support,

[183] State Committee on Statistics of Turkmenistan. (2023). *State Statistical Yearbook 2023* (p. 213). Ashgabat: State Committee on Statistics.
[184] TheGlobalEconomy.com. (2018). *Student teacher ratio, primary school – Country rankings*. Retrieved from https://www.theglobaleconomy.com/rankings/student_teacher_ratio_primary_school/

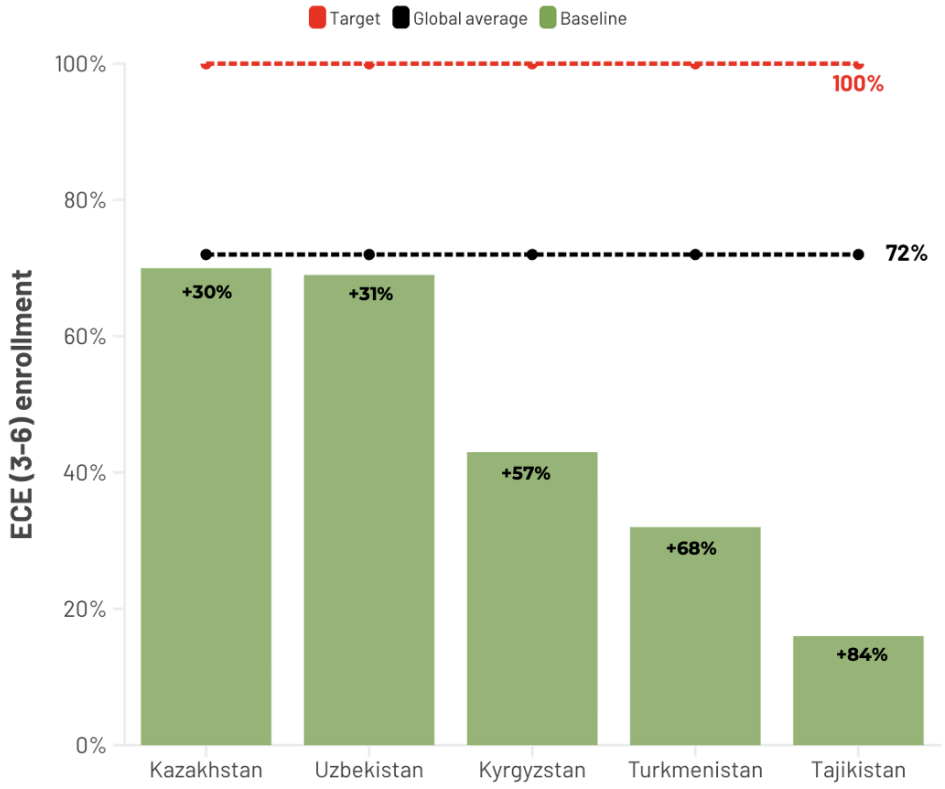
ensuring the establishment of conducive learning environments, expanding access to quality pre-primary education, and strengthening curriculum and assessments.

5.3.3. Proposed intervention scale ups by 2050

To close the education gaps and boost human capital, Central Asian countries will need to implement a set of proven, cost-effective interventions. The Generation 2050 investment needs analysis has identified several priority education interventions, along with specific targets for 2035. These focus on increasing enrollment at all key stages and improving learning quality. Each intervention addresses a critical bottleneck in the current system:

Expanding access to early childhood education is one of the highest-return investments for human capital. The goal is to raise pre-school net enrollment of children ages 3–6 to 100% by 2050 in every Central Asian country (from baseline levels of 68.7% in Kazakhstan, 75% in Uzbekistan, 43% in Kyrgyzstan, 15-17% in Tajikistan, and 31% in Turkmenistan in 2025).[185] Achieving this means building more kindergartens or preschool classes (especially in rural areas), funding alternative community-based preschool programs, and training early childhood educators. Early childhood education is crucial because it improves school readiness, cognitive development, and later learning outcomes – children who attend quality pre-school are more likely to succeed in primary school and beyond. Investing in universal preschool now will yield long-term economic returns by improving the human capital of the entire cohort of young children.

Figure 24. ECE net enrollment

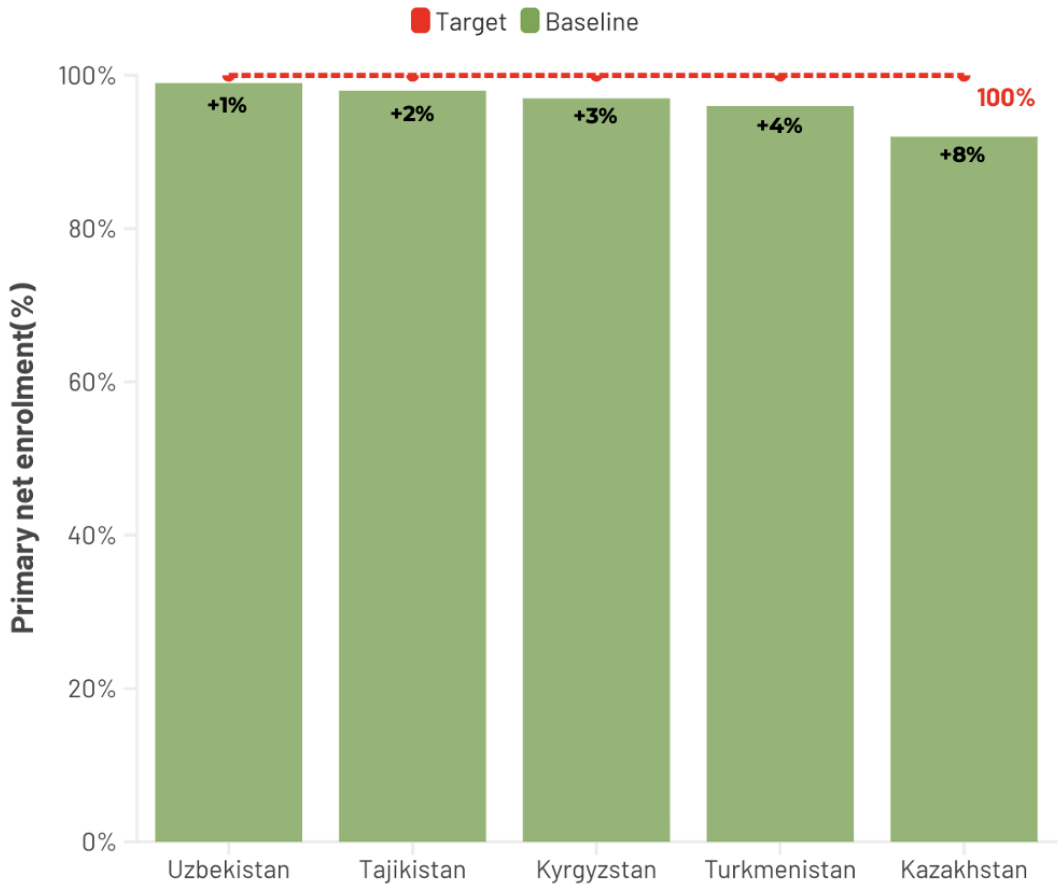


Source: UNESCO Institute for Statistics. (2025). Total net enrolment rate, by level of education [Data set]. https://databrowser.uis.unesco.org/view
The world average is 72.38 percent, based on data from 136 countries. Source:UNESCO

[185]UNESCO Institute for Statistics. (2025). *Total net enrolment rate, by level of education* [Data set]. https://databrowser.uis.unesco.org/view

While primary school enrolment is already high, the aim is to ensure net primary enrollment/attendance reaches 100% by 2035 (from baselines of 92% in Kazakhstan, 99% in Uzbekistan, 97% in Kyrgyzstan, 98% in Tajikistan, 96.0% in Turkmenistan in 2025)[186] and that all children not only enroll but complete primary education. This intervention involves identifying and bringing into school the remaining out-of-school children (often the most marginalized – children with disabilities, children in remote areas, or from nomadic families). It also means reducing dropouts through measures like conditional cash transfers or school feeding programs to incentivize attendance for poor families. Ensuring every child completes primary education is fundamental for human capital – basic literacy and numeracy acquired in primary school form the foundation for all future learning and productivity. Moreover, primary education for girls has multiplier effects: a mother's education level is strongly linked to better health and education outcomes for her children, contributing to a virtuous cycle of human capital development.

Figure 25. Primary net enrolment



Source: UNESCO Institute for Statistics. (2025). Total net enrolment rate, by level of education [Data set]. https://databrowser.uis.unesco.org/view

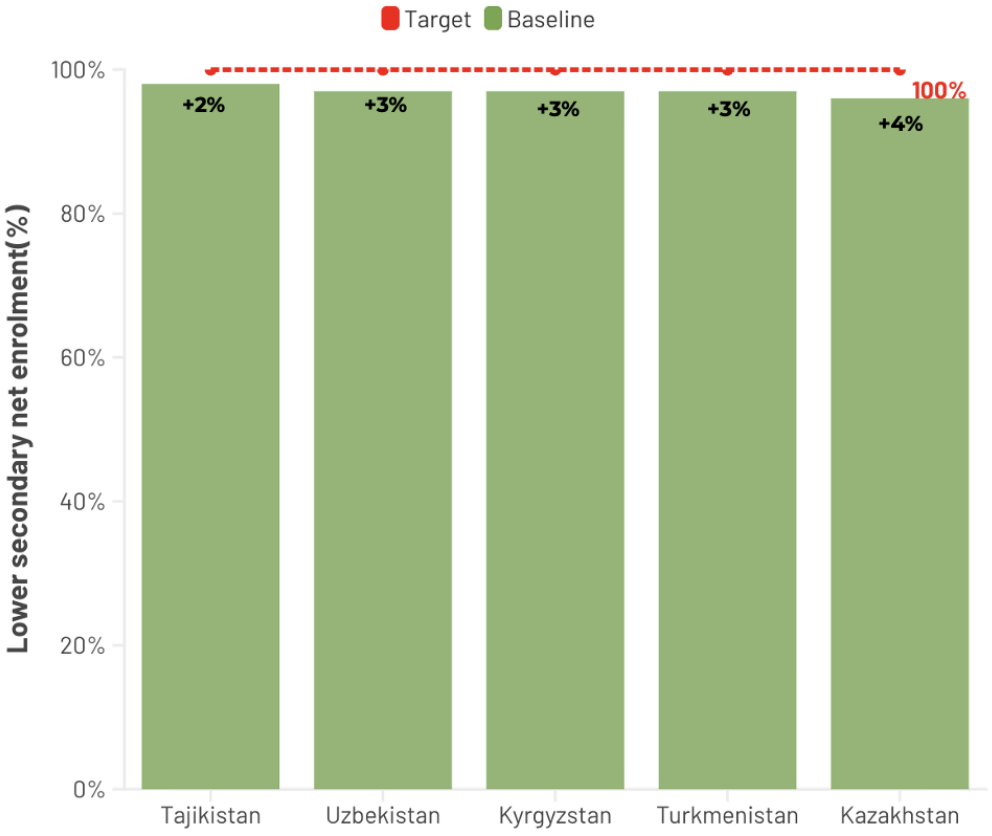
Extending the focus to older children, the target is 100% net lower and upper secondary school enrolment by 2035 in each country (up from current net lower secondary enrolment of 96% in Kazakhstan, 97% in Uzbekistan, 97% in Kyrgyzstan, 98% in Tajikistan, and 97% in Turkmenistan).[187] This

[186] UNESCO Institute for Statistics. (2025). *Net enrolment rate and other enrolment-attendance indicators* [Data set]. Retrieved from https://databrowser.uis.unesco.org/view

[187] UNESCO Institute for Statistics. (2025). *Net enrolment rate and other enrolment-attendance indicators* [Data set]. Retrieved from https://databrowser.uis.unesco.org/view

implies not only universal lower secondary (which is often compulsory), but also greatly increasing the retention of students through upper secondary (grades 10–11 or 12). Key interventions include: making upper secondary education more accessible (for example, building new secondary schools in underserved areas or providing transportation and stipends for rural students), addressing cultural barriers to girls' schooling beyond puberty (community engagement to support girls' education, providing safe school environments and sanitation facilities for adolescent girls), and expanding vocational/technical secondary tracks that might better engage students who would otherwise drop out. Completing secondary education equips students with higher-order skills and knowledge, vastly improving their employment prospects and earning potential in adulthood. In today's economies, a secondary diploma is often the minimum needed for formal employment, and countries that fail to graduate most of their youth from secondary school will struggle to build a skilled workforce.

Figure 26. Lower secondary net enrollment



Source: UNESCO Institute for Statistics. (2025). Total net enrolment rate, by level of education [Data set]. https://databrowser.uis.unesco.org/view

An important intervention for improving education outcomes is increasing the number of qualified teachers (particularly in countries with high pupil-teacher ratios like Turkmenistan, Kyrgyzstan, and Tajikistan) and improving teacher training. Ensuring an adequate teacher-to-pupil ratio (e.g. bringing it down to around 15:1, which is common in high-performing systems[188]) by 2035 will require recruiting new teachers and incentivizing deployment to rural and remote areas.[189] In parallel, raising teacher quality through better pre-service education and continuous professional development

[188] Statistisches Bundesamt (Destatis). (n.d.). *International statistics: Key table pupil-teacher ratio (primary)*. Retrieved August 13, 2025. Available here.

[189] Pupil-teacher ratio was not included in our investment model costing framework due to difficulties in costing and inadequacy of data.

is critical. Teacher effectiveness is one of the most important determinants of learning outcomes – effective teachers can dramatically improve students' achievement. Thus, interventions like mentoring programs, in-service pedagogical training (especially on student-centered and competency-based approaches), and performance incentives for teachers complement the quantitative expansion of the teaching workforce. These contribute to improving learning outcomes, which is the ultimate goal of increased enrollments. For instance, training teachers in interactive, play-based methods in early grades can help ensure that simply getting children into school translates into actual literacy and numeracy.[190]

5.3.4. Optimising the Investments

Achieving universal pre-primary, primary, and secondary education with good quality in Central Asia requires not only increased funding but also systemic reforms. Key principles including efficiency in service delivery, equity of access, effectiveness (quality) of education, and environmental & financial sustainability must guide investments so that every dollar yields maximum impact.

Efficiency in service delivery

With limited budgets, it's critical to maximize value for money in education. In Central Asia, countries—with the exception of Kazakhstan and Turkmenistan—are already investing over 5% of GDP in education[191]. Moreover, these countries spend around 15–20% of total public budgets on education, comparable to OECD levels, yet they often still see poorer learning outcomes[192] indicating there is significant scope to use resources more efficiently. Approaches to improve efficiency include: :

Optimize teacher and school allocation by avoiding situations where some schools are over-resourced while others lack basics. For example, parts of Turkmenistan have half-empty classes due to falling student numbers,[193] whereas Kazakhstan's capital Astana faces a shortage of 270,000 school places, forcing many schools into double or triple shifts with overcrowded classrooms.[194] Better workforce planning and incentives can redistribute teachers and align school construction with demographic needs, preventing under-utilized staff in one area and overfilled classes in another.

Leverage data and technology for efficiency through implementing Education Management Information Systems (EMIS)[195] to track metrics like student–teacher ratios, school enrollment vs. capacity, and budget execution in real time. This data-driven approach enables more rational allocation of resources (e.g. moving teachers or funds where needs are greatest). Technology can also improve cost-effectiveness through blended teacher training programmes that combine digital tools with in-person professional development at school level, ensuring both scalability and practical application. Once digital learning content (e-textbooks, learning apps) is developed, it can be distributed widely at minimal cost.Kazakhstan's relatively strong ICT infrastructure helped it transition more smoothly to online teaching during COVID-19,[196] illustrating how upfront tech investments can increase system efficiency and resilience. Thanks to the GIGA initiative[197], Uzbekistan has achieved

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[190] UNICEF Europe and Central Asia. (n.d.). *Education*. UNICEF. Retrieved August 13, 2025. Available here.

[191] World Bank. (2025). *Government expenditure on education, total (% of GDP)* [Data set]. World Development Indicators. The World Bank Group. https://data.worldbank.org/indicator/SE.XPD.TOTL.GD.ZS

[192] World Bank. (n.d.). *Investing today in human capital for a brighter future tomorrow*. World Bank Blogs. Retrieved August 13, 2025. Available here.

[193] *Tishchenko, I. (2023, September 15). The Struggle to Learn: Education in Central Asia. Radio Free Europe/Radio Liberty.* Available here.

[194] Ibid

[195] In this report, EMIS refers to a dynamic, integrated Education Management Information System that supports real-time data collection, analysis, and use in decision-making—going beyond static annual datasets to link information systems, planning, and resource allocation.

[196] Bauer, M., Gürbüz, E., & Gümüs, E. (2020, December 16). *A teachers' experience of Central Asia during the COVID-19 crisis*. European Training Foundation. Available here.

[197] UNICEF & International Telecommunication Union. (2022). *Sustainable school connectivity in Uzbekistan: GIGA case study.* UNICEF. https://s41713.pcdn.co/wp-content/uploads/2022/10/Case-Study-Sustainable-School-Connectivity-in-Uzbekistan.pdf

essentially full school connectivity, paving the way for more extensive digital learning and real-time monitoring of education systems.

Public–private partnerships (PPPs) and alternative delivery models: Engaging non-state partners can expand services cost-effectively. Uzbekistan provides a best-practice example, having leveraged innovative PPPs in early education – over just a few years, access to preschool in Uzbekistan increased by 40%, as private providers and alternative community-based kindergartens helped bring services to more children.[198] Such partnerships, with the government maintaining financing and quality oversight, can reduce the burden on the public sector while rapidly scaling up access in areas like preschool or vocational training.

Equity and Inclusion

Universal education cannot be achieved unless investments prioritize the children who are hardest to reach – those in remote rural areas, from poor families, girls, ethnic minorities, and children with disabilities. To ensure equitable access and inclusion, Central Asian countries should:

Target underserved regions and populations: Resources must be directed to rural and low-income areas that have historically been neglected. For example, Tajikistan's preschool net enrollment was only 11% in 2014 – the lowest in the region[199] – with rural villages especially lacking preschool services. Efforts to raise this toward 100% will require building most new preschools in remote communities and poorer districts. Governments can use pro-poor funding formulas (allocating more funds per student to rural and disadvantaged schools) to level the playing field. Kazakhstan's education experts note that improving rural school quality is essential to slow excessive migration to overcrowded city schools,[200] thus balancing demand.

Promote gender equity in schooling: Measures to keep girls in school are vital, especially at the secondary level. Across Central Asia, girls often face higher dropout rates in upper grades due to early marriage, safety concerns, or social norms. In Tajikistan, for instance, only 64% of girls transition from lower to upper secondary school, compared to 86% of boys.[201] To close this gap, interventions include providing safe transportation for girls in rural areas, recruiting more female teachers (who can serve as role models and create a more welcoming environment for girl students), and ensuring schools have separate sanitation facilities and hygiene support for adolescent girls. Such steps have been shown to improve girls' attendance and retention.[202]

Include children with disabilities in mainstream education: Rather than segregating children with disabilities in special institutions, the goal is to accommodate them in regular schools with appropriate support. Currently, the majority of children with disabilities in the region are excluded from mainstream schooling – for example, in Tajikistan only 19% of 7–18-year-olds with disabilities attend mainstream schools[203] (implying that about 81% are either in special schools or not in school at all). Central Asian countries are beginning to shift toward inclusive education policies: this involves training teachers in inclusive pedagogy, modifying school buildings for accessibility (ramps, assistive devices), and providing specialist aides or therapists as needed. Over time, moving toward inclusive education not only is more equitable but can be more efficient than maintaining separate institutions. Community outreach is also important to overcome stigma and convince parents that children with disabilities have a right to learn alongside their peers.

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198 UNICEF Uzbekistan. (2020, December 1). *Quality pre-school education is essential for ensuring the best start in children's lives*. UNICEF. Available here.
199 UNICEF Tajikistan. (n.d.). *Access to education*. UNICEF. Retrieved August 13, 2025. Available here.
200 Tishchenko, Ibid
201 UNICEF Tajikistan, Ibid
202 Ibid
203 Ibid

Effectiveness and quality of education

Expanding access is not enough – the effectiveness of education (i.e. its quality and learning outcomes) must improve in parallel. Many Central Asian education systems face a learning crisis: students attend school but do not acquire strong foundational skills. For instance, over 80% of 15-year-old students in Kyrgyzstan scored below basic proficiency in reading and math on PISA 2010,[204] and in Tajikistan a 2017 assessment found 77% of second-graders could not meet national reading fluency benchmarks. To address such gaps, reforms should focus on:

Strengthening curriculum and assessment: Modernizing curricula to focus on 21st-century skills (critical thinking, digital literacy, multilingual communication, etc.) and ensuring alignment with labor market needs will make education more effective. Several Central Asian countries are already updating curricular standards in line with international benchmarks. Equally important is establishing robust systems to measure learning outcomes. Regular student assessments – both national exams and participation in international studies – are needed to identify weaknesses and drive improvement. Kazakhstan and Kyrgyzstan have long participated in international assessments like PISA and TIMSS, and Uzbekistan joined PISA in 2022 and TIMSS in 2023, marking a significant step toward international benchmarking[205]. These assessments provide valuable data on student performance relative to global standards and help identify systemic gaps. Expanding participation—particularly for countries like Tajikistan and Turkmenistan that have yet to engage—will be key to tracking progress across the region.

At the classroom level, formative assessments should be used to personalize instruction. When data reveal gaps (e.g. rural students lagging urban, or mathematics scores far below reading), targeted initiatives – like early grade reading programs or math teacher coaching – can be implemented. Over time, improved assessments aligned with the curriculum and accountability will help translate schooling into actual learning gains.

Improving teaching quality: Teachers are the most important factor in student learning. Governments need to elevate the teaching profession through better training, support, and incentives. Currently, many Central Asian countries struggle to attract and retain qualified teachers – low salaries and limited career growth make teaching less appealing, contributing to shortages especially in rural areas.[206] Raising teacher pay (within sustainable budgets) and providing ongoing professional development are critical. Innovative approaches are emerging: for example, the Kyrgyz Republic recently introduced classroom observations and feedback for teachers to improve instructional practice.[207] Similarly, Kazakhstan has created a system of teacher certification with salary bonuses for higher qualification. Scaling up such best practices – along with mentoring programs and communities of practice for teachers – can significantly boost pedagogical skills.

Climate Sensitive Adaptations

The region faces rising climate and disaster risks – from more extreme temperatures to earthquakes and floods. Many existing schools are in hazard-prone areas and not built to modern safety standards.[208] Governments are now prioritizing safe schools: all five Central Asian republics have committed to a Comprehensive School Safety Framework 2022–2030 to strengthen disaster

[204] Worldbank, Ibid

[205] Organisation for Economic Co-operation and Development. (2023). *PISA 2022 results: Volume I & II—Country notes: Uzbekistan*. OECD Publishing. https://www.oecd.org/content/dam/oecd/en/publications/reports/2023/11/pisa-2022-results-volume-i-and-ii-country-notes_2fca04b9/uzbekistan_482bdcce/2bb94bf1-en.pdf

[206] Worldbank, Ibid

[207] Ibid

[208] UNICEF Europe and Central Asia. (2024, May 14). *Central Asian countries strengthen commitment to school safety and resilience*. UNICEF. Available here.

resilience.[209] New school construction and renovations should include earthquake-resistant design in seismic zones (e.g. much of Tajikistan and Kyrgyzstan), sturdy roofing and drainage to handle heavy rains or snow, and insulation and efficient heating/cooling systems to reduce energy use. For example, schools rebuilt with seismic standards in Turkey and other regions have proven capable of surviving strong earthquakes,[210] a model Central Asia is adopting. Installing solar panels or using energy-efficient lighting in schools (as piloted in some Kazakh and Uzbek schools) can cut long-term costs and model environmental stewardship for students. Additionally, integrating WASH facilities that are climate-resilient – like water-saving toilets and safe drinking water systems – ensures that schools remain functional and healthy during climate stresses. Beyond infrastructure, curricula can incorporate environmental education and climate awareness, so students learn about sustainable practices and are prepared for "green economy" jobs in the future.

Financial Sustainability

Large donor-funded programs – for example, new preschool construction supported by development banks or UNICEF – can kick-start progress, but governments must be ready to finance recurrent costs (teachers, maintenance, learning materials) once external funding ends. This means planning gradual increases in education spending that are feasible within national budgets. Currently, most Central Asian countries spend around 4–6% of GDP on education (e.g. Tajikistan 5.2% in recent years), and these shares may need to rise as enrollment grows. Ministries of Finance and Education should collaboratively develop multi-year budget plans for scaling up staffing and operations in tandem with capital investments. Difficult trade-offs might be required – for instance, reducing expenditures on lower-priority areas to free resources for education. Countries can also explore innovative financing mechanisms to support education expansion without overburdening public budgets. For example, impact bonds and outcome-based financing are being tried in Uzbekistan to expand preschools, linking funding to results.[211] Public–private partnerships can attract private capital or expertise, as seen with several new schools in Kazakhstan built through PPP arrangements. Any such models must be designed carefully to ensure accountability and equity, but they can complement public financing. A combination of efficient use of resources, increased domestic funding, and smart external partnerships will help maintain reforms over time without financial strain.

5.4. Water, Sanitation, and Hygiene

5.4.1. Introduction to the Sector

Water, Sanitation, and Hygiene (WaSH) is a fundamental sector comprising three interrelated components: safe drinking water supply, adequate sanitation facilities, and hygiene practices (such as handwashing). Safe water involves providing improved water sources that are accessible on premises, reliably available, and free from contamination.[212] Sanitation entails facilities that hygienically separate human waste from contact – from basic latrines to flush toilets with sewage treatment. Hygiene, often the neglected component, includes the availability of functional handwashing facilities (such as sinks, washstands, etc.) as well as behaviors like regular handwashing with soap and menstrual hygiene management.

WaSH is crucial for human capital development because it underpins health and productivity. Clean water and proper sanitation dramatically reduce infectious diseases (like diarrhea, cholera, and

[209] Ibid
[210] World Bank. (2023, June 7). *How safer and more resilient schools withstood the earthquakes in Türkiye*. The World Bank. Available here.
[211] UNICEF. (n.d.). *Lessons learned from designing social impact bonds to expand preschool education (Uzbekistan)*. Retrieved August 13, 2025. Available here.
[212] World Bank. (2023, March 22). *World Water Day: Two billion people still lack access to safely managed water*. World Bank Blogs. Available here.

intestinal parasites) that impair child growth and cognitive development. For example, lack of safe WaSH is linked to childhood stunting (which remains a concern in parts of Central Asia) and school absenteeism. Conversely, investing in WaSH yields economic benefits by averting health costs and saving time (especially for women and children who might otherwise fetch water). It is estimated that every dollar invested in sanitation returns several dollars in health and productivity gains.[213] Moreover, reliable WaSH services contribute to gender equality (girls are more likely to attend school when there are safe toilets)[214] and overall well-being. In Central Asia, improving WaSH is also about climate resilience – water security is threatened by glacial melt and aridization, making efficient water management essential.[215] WaSH is a foundational sector: without safe water and sanitation, other human capital investments (in health and education) cannot achieve full impact.

5.4.2. WaSH in Central Asia

Central Asian countries have achieved near-universal basic water and sanitation coverage, but safely managed services (which meet higher standards of quality and treatment) still lag behind – especially in poorer and rural areas. For safely managed drinking water, the region shows mixed performance *(see Figure 25)*. Kazakhstan and Turkmenistan lead with roughly 92% and 95% of their populations using safely managed water in 2024[216,217]. Uzbekistan follows at about 82%,[218] and Kyrgyzstan 74%[219] , while Tajikistan trails with 65%, the lowest level of access to safely managed drinking water in Central Asia..[220] In other words, nearly half of Tajikistan's population still relies on unsafe or unimproved sources. (For comparison, about 74% of the global population used safely managed water in 2024).[221] All five countries have set ambitious targets of 100% access to safe water by 2035 (and sustaining that through 2050). Achieving this will require closing the urban-rural gap. Urban centers often have decent infrastructure, but rural communities lag – for example, only 22% of rural Tajikistan's residents have piped water on premises (versus 95% in cities).[222] Similarly, in Turkmenistan 98% of urban dwellers use improved water sources, compared to 73% in rural areas.[223] Without accelerated investments, countries like Tajikistan will remain below global averages.

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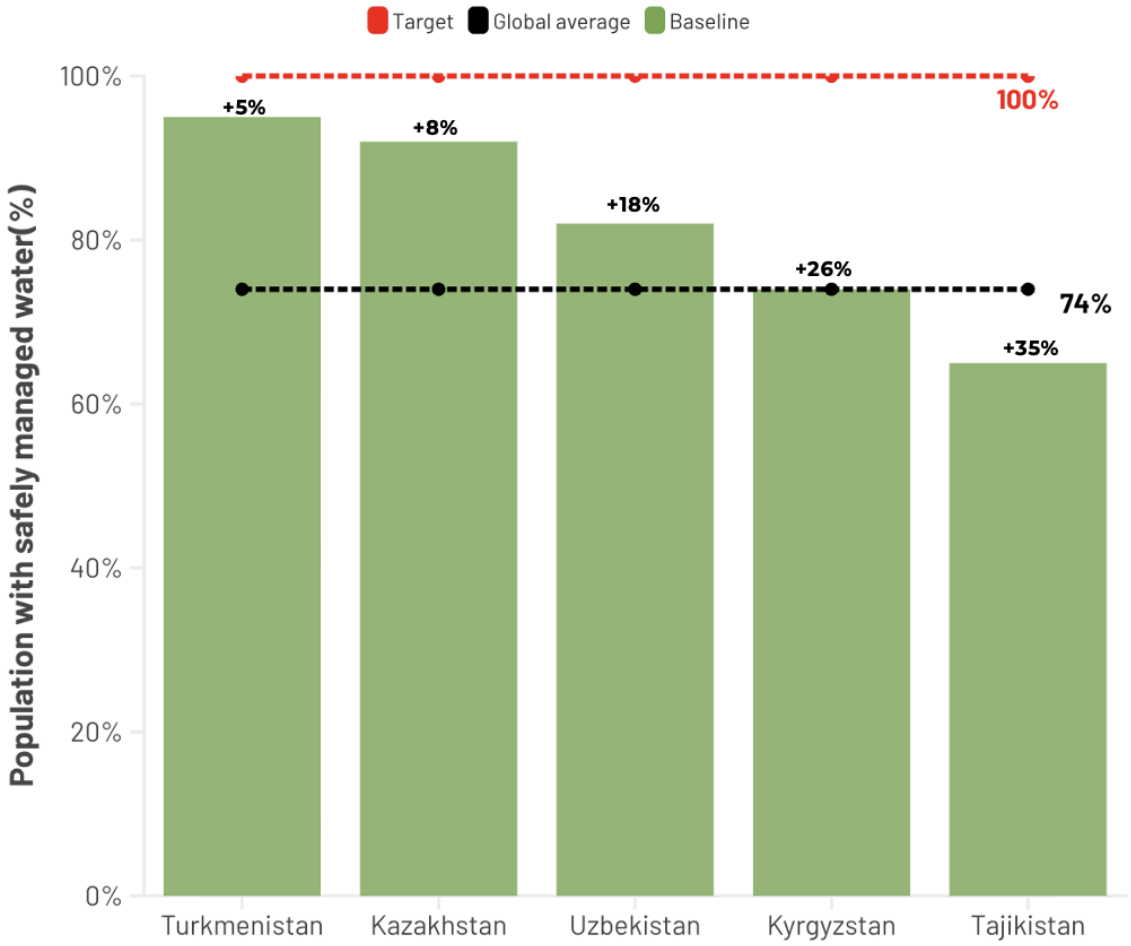
213 Ibid
214 World Bank. (2023, February 23). *Tajikistan's Education Outcomes to Improve with Support from a New World Bank Project*. The World Bank. Available here.
215 United Nations. (2020). *The Sustainable Development Goals report 2020*. United Nations. Available here.
216 Data, N. U. (n.d.). *Kazakhstan*. SDG 6 Data Portal. Retrieved August 15, 2025. Available here.
217 Data, N. U. (n.d.). *Turkmenistan*. SDG 6 Data Portal. Retrieved August 15, 2025. Available here.
218 Data, N. U. (n.d.). *Uzbekistan*. SDG 6 Data Portal. Retrieved August 15, 2025. Available here.
219 Data, N. U. (n.d.). *Kyrgyzstan*. SDG 6 Data Portal. Retrieved August 15, 2025. Available here.
220 World Bank. (2022, June 23). *Tajikistan to improve access to safe drinking water with World Bank support*. The World Bank. Available here.
221 UNICEF & World Health Organization. (2023). *Progress on household drinking water, sanitation and hygiene 2000–2022: Special focus on gender*. UNICEF. Available here.
222 Central Asia Climate Portal. (2020, December 16). *Clean water and sewage for all: Tajikistan to have them by 2040*. Available here.
223 UNICEF Turkmenistan. (n.d.). *Children in Turkmenistan*. UNICEF. Retrieved August 15, 2025. Available here.

Figure 27. Population with safely managed water



Source: UN-Water. (2025). SDG 6 Data Portal. https://www.sdg6data.org/en

Turning to safely managed sanitation, basic toilet access is nearly universal in Central Asia, but the quality of service (containment and treatment of waste) varies. Official estimates show Uzbekistan at about 75% safely managed sanitation in 2024[224],and Kyrgyzstan at around 93%[225]. Official estimates for Kazakhstan, Tajikistan and Turkmenistan are not available. In practice, this means tens of millions of people use toilets that do not safely dispose of waste. Urban sewer systems cover only parts of the population – for example, only about 14% of Uzbekistan's people are connected to a centralized sewer network,[226] and in Tajikistan an estimated 59% of the population use toilets not connected to sewers.[227] Rural households mostly rely on pit latrines or septic tanks, which count as "improved" sanitation but are often not safely managed (waste seeps into the environment). All Central Asian countries have virtually eliminated open defecation and achieved over 98% basic sanitation coverage, a major public health victory. However, safely treating or disposing of waste is the next challenge. By 2035 each country targets 100% safely managed sanitation. Without new efforts, progress may

[224] Uzbekistan. (2024). *SDG 6 snapshot: Uzbekistan*. WHO/UNICEF Joint Monitoring Programme. Retrieved from https://www.sdg6data.org/en/country-or-area/Uzbekistan

[225] Kyrgyzstan. (2024). *SDG 6 snapshot: Kyrgyzstan*. WHO/UNICEF Joint Monitoring Programme. Retrieved from https://www.sdg6data.org/country-or-area/kyrgyzstan

[226] Asian Infrastructure Investment Bank. (2020). *Bukhara Region Water Supply and Sewerage Project: Project summary information*. Available here.

[227] Central Asia Climate Portal. (2020, December 16). *Clean water and sewage for all: Tajikistan to have them by 2040*. Available here.

stagnate – improved latrines alone are not enough if fecal waste isn't handled safely. Notably, only 32% of wastewater in Uzbekistan is currently treated,[228] and other countries face similar gaps. Achieving the 100% target will require upgrading infrastructure (e.g. sewers, treatment plants) and on-site solutions in rural areas.

Access to basic hygiene facilities – a designated place to wash hands with soap and water – is relatively high in Central Asia, but not yet universal in every country. Kazakhstan, Turkmenistan, and Kyrgyzstan have achieved near-universal coverage (around 97- 100% of households have handwashing facilities)[229],[230],[231]. Uzbekistan is somewhat lower, with about 75% of the population having a soap-and-water station at home as of 2024.[232] In terms of schools in Uzbekistan, the situation is better than at household level. As of 2023, surveys show 90% (8.5m) of school children in Uzbekistan had access to basic handwashing facilities with soap and water[233]. Tajikistan is lowest at roughly 68%[234], meaning over a quarter of Tajik households still lack a basic handwashing facility. (By comparison, around 71% of households globally has a handwashing facility with soap and water).[235] All Central Asian countries aim for 100% access to hygiene facilities by 2035. High overall rates mask some rural and institutional deficiencies: in rural Uzbekistan and Tajikistan, soap availability can be sporadic, and surveys have found many schools without functional handwashing stations. In fact, a recent assessment in Tajikistan revealed that virtually no schools – only about 1% – had adequate menstrual hygiene management facilities for girls,[236] highlighting the gaps in hygiene infrastructure beyond the home. The challenge ahead is ensuring that behavior matches infrastructure – even where facilities exist, consistent handwashing with soap must become a universal habit. This is critical for reaping health gains: adequate handwashing can reduce diarrheal and respiratory diseases significantly.

In summary, Central Asia's WaSH outcomes show strong basic coverage, but to achieve the 2035/2050 goals, the focus now shifts to safely managed services and hygiene practices. Each country will need to invest in closing rural service gaps and upgrading quality (e.g. water treatment, sewage treatment, and hygiene promotion) to ensure no one is left behind.

5.4.3. Proposed intervention scale ups by 2050

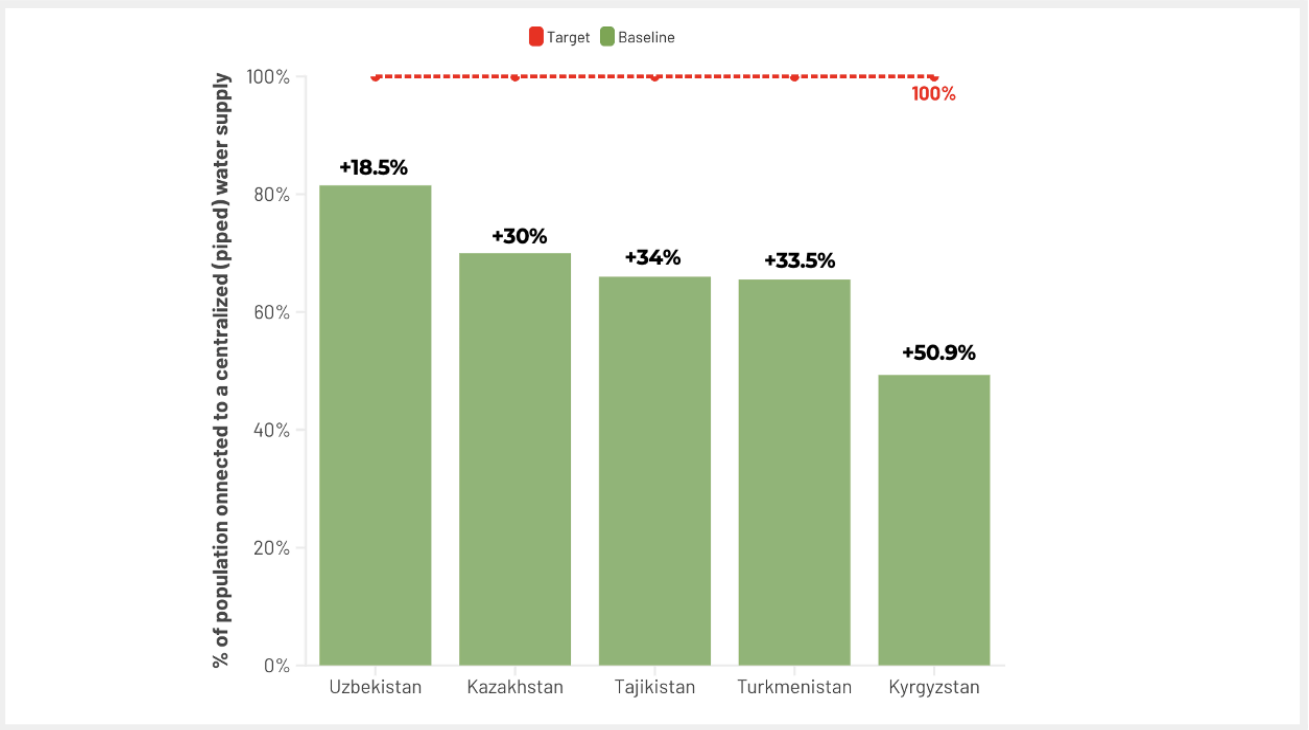
Reaching 100% safely managed water means bringing piped or otherwise improved, clean water to remaining underserved populations, particularly in rural areas. In Tajikistan and Kyrgyzstan, rural water supply is the top priority: as noted, only 22% of rural Tajik residents currently have piped water,[237] and Tajikistan's overall safely managed water access (about 55% in 2022) must rise to 100% by 2035. Similarly, Kyrgyzstan (76% in 2022) and Uzbekistan (80% in 2022) must close rural gaps to reach 100%. These countries are investing in rural water system expansion – drilling new wells and construction of community level water treatment facilities, installing water treatment equipment (reverse osmosis systems) in schools, constructing water reservoirs for water storage , installing solar-powered pumps,

[228] United Nations Economic Commission for Europe. (2024, March 14). *Strengthening action in Uzbekistan on water & sanitation and protection of water resources from accidental pollution in the face of climate change*. Available here.
[229] Kazakhstan. (2024). *SDG 6 snapshot: Kazakhstan*. WHO/UNICEF Joint Monitoring Programme. Retrieved from https://www.sdg6data.org/country-or-area/Kazakhstan
[230] Turkmenistan. (2024). *SDG 6 snapshot: Turkmenistan*. WHO/UNICEF Joint Monitoring Programme. Retrieved from https://www.sdg6data.org/country-or-area/Turkmenistan
[231] Tajikistan. (2024). *SDG 6 snapshot: Tajikistan*. WHO/UNICEF Joint Monitoring Programme. Retrieved from https://www.sdg6data.org/country-or-area/Tajikistan
[232] Uzbekistan. (2024). *SDG 6 snapshot: Uzbekistan*. WHO/UNICEF Joint Monitoring Programme. Retrieved from https://www.sdg6data.org/en/country-or-area/Uzbekistan
[233] World Health Organization (WHO) & United Nations Children's Fund (UNICEF). (2024). Progress on Drinking Water, Sanitation and Hygiene in Schools. Retrieved from https://washdata.org/reports/jmp-2024-wash-schools
[234] Tajikistan. (2024). *SDG 6 snapshot: Tajikistan*. WHO/UNICEF Joint Monitoring Programme. Retrieved from https://www.sdg6data.org/country-or-area/Tajikistan
[235] Data, N. U. (n.d.). *Tajikistan*. SDG 6 Data Portal. Retrieved August 15, 2025. Available here.
[236] International Human Rights Law Review. (2021, November 1). *The right to menstrual hygiene: Period poverty in developing countries*. University of Cincinnati College of Law Blogs. Available here.
[237] Central Asia Climate Portal, Ibid

and building village-level piped networks. Such projects are highly cost-effective because they yield multiple benefits: they reduce water-borne diseases, cut economic losses, and save women and children time fetching water. For example, a World Bank-supported program in Tajikistan is bringing safe water to 250,000 rural people in Khatlon province,[238] targeting areas with the lowest coverage. By improving wells, storage, and chlorination, these interventions will drastically lower diarrheal disease. In neighboring Kyrgyzstan, analyses have shown that water-borne illnesses cost the economy tens of millions per year – one study estimated about $125 million in annual losses due to poor water in Kyrgyzstan.[239] Thus, investments in clean water infrastructure effectively pay for themselves through improved health and productivity.

In urban areas, the focus is on **modernizing aging water infrastructure** to ensure reliability and quality. Cities like Tashkent and Almaty have old pipelines and intermittent supply in some districts. Upgrading treatment plants and distribution networks (e.g. replacing leaky Soviet-era pipes) is crucial for these countries to maintain high access rates (Kazakhstan and Turkmenistan already exceed 90% safely managed water) and reach the last few percent by 2035. These upgrades reduce water losses and improve service quality at relatively low cost per capita in dense cities. In Uzbekistan, UNICEF is collaborating with ADB funded Project "Climate-Smart Water Management Improvement " to support the educational component on promoting WASH in communities, schools and healthcare facilities.Additionally, **water quality monitoring and household treatment** are cost-effective supporting measures: establishing low-cost water testing (e.g. field test kits in each district) and promoting household filters or chlorination where needed can ensure that even remote communities have potable water. Such measures cost only a few cents per person and can prevent outbreaks – an important stopgap while larger infrastructure is built. In Uzbekistan, UNICEF supported the hygiene laboratories of the Committee for Sanitary-Epidemiological Wellbeing and Public Health in Karakalpakstan and developed a tailor-made information system on drinking water quality monitoring.

Figure 28. Piped/centralized water coverage

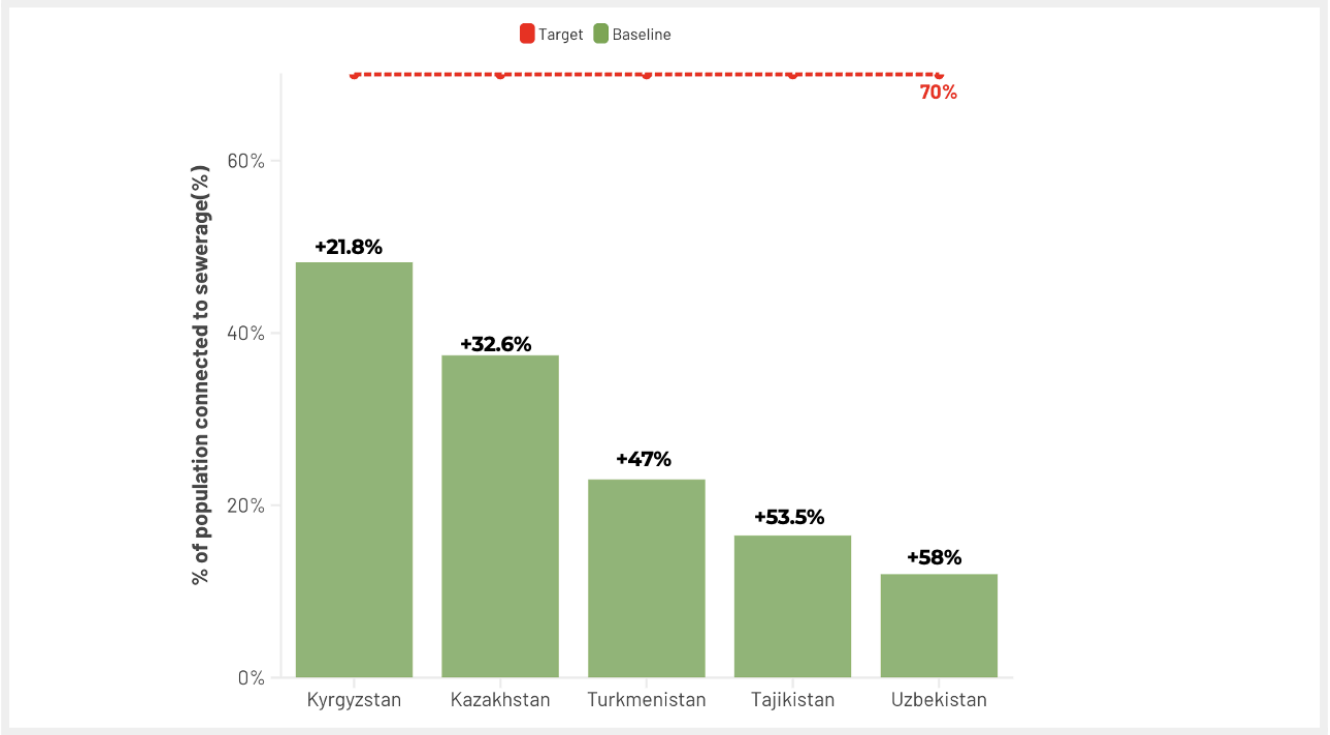


[238] World Bank. (2022, June 23). *Tajikistan to improve access to safe drinking water with World Bank support*. The World Bank. Available here.

[239] Global Water Partnership. (2013). *Kyrgyzstan: Program Taza Suu for improvement of rural water supply and sanitation conditions* (# 360). Available here.

To reach 100% safely managed sanitation by 2035, Central Asia must address both urban wastewater infrastructure and rural household sanitation. Urban sewerage expansion is a major intervention in Uzbekistan, Kazakhstan, and Tajikistan. Currently, sewer connection rates are low – for example, only about 14% of Uzbekistan's population is on centralized sewage systems,[240] and in Tajikistan only 18–20% (mostly urban) have sewer access.[241] The rest use latrines or septic tanks that often discharge untreated waste. Urban investments will focus on extending sewer networks to more neighborhoods and constructing sewage treatment plants. These projects are costlier than simple latrines, but they are justified in densely populated areas to safely treat large volumes of waste and protect drinking water sources. They also bring environmental benefits. For instance, the government of Tajikistan has pledged that 100% of homes will be connected to centralized sewerage by 2040.[242] The cost-effectiveness comes from economies of scale in cities: one treatment plant can serve tens of thousands, preventing disease outbreaks (like hepatitis or cholera) that would be very costly to society. In Uzbekistan, projects such as the ADB-supported expansion of Tashkent province's sewer system (where 2.5 million people rely on pit latrines) are expected to greatly improve public health.[243]

Figure 29. Sewerage connection



For rural and small-town sanitation, the strategy revolves around improved on-site solutions. It is neither practical nor economical to build sewers to every village, so countries are promoting ventilated improved pit latrines, pour-flush toilets with septic tanks, and small-scale wastewater treatment units where feasible. The key is to make these "safely managed". This involves steps like lining pits to prevent seepage, providing each latrine with a washable slab and lid, and crucially, setting up fecal sludge management services to periodically empty pits/septics and treat the waste. Kyrgyzstan and Turkmenistan, which by 2025 already report around 95% safely managed sanitation, have many households with septic tanks; ensuring these are regularly emptied and the sludge treated (for example, in controlled drying beds or co-composting sites) will achieve the SDG standard. These interventions are low-cost relative to sewers: training local entrepreneurs with a vacuum truck or even

[240] Asian Infrastructure Investment Bank, Ibid
[241] Central Asia Climate Portal, Ibid
[242] Ibid
[243] Asian Development Bank. (2022). *Tashkent Province Sewerage Improvement Project: Sector Assessment (Summary).* Available here.

simple pit-emptying pumps can serve whole districts for a modest investment. Such community-based sanitation management has proven effective in South Asia and Africa, and can be adapted to Central Asia's context. By 2035, the aim is that even rural Tajikistan will approach 100% through a combination of upgraded latrines and clustered mini-sewage systems in larger villages. Finally, wastewater treatment must improve alongside access. It's not enough to connect homes to sewers if treatment plants are absent – currently only about one-third of Central Asia's wastewater is safely treated (e.g. 32% in Uzbekistan[244]). Thus, new treatment facilities – from big municipal plants to small decentralized units – are part of the intervention mix. These prevent pollution of rivers and groundwater, yielding significant health and environmental returns. In sum, safely managed sanitation will be achieved through a dual approach: expand centralized infrastructure where population density warrants it, and upgrade on-site sanitation elsewhere.

Infrastructure alone cannot improve health without proper hygiene practices. Thus, a critical intervention for Central Asia is a concerted hygiene promotion campaign to achieve universal handwashing and safe hygiene behaviors by 2035. The baseline varies: nearly all households in Kazakhstan, Turkmenistan, and Kyrgyzstan have soap and water available (≥99% coverage), but in Uzbekistan and Tajikistan many families lack either the facility or the habit. All countries target 100% basic hygiene access by 2035, which means not only installing handwashing stations where needed (for the remaining few percent of homes, and in schools and health clinics), but also driving behavior change so that everyone washes hands with soap at critical times. **Hygiene promotion** is one of the most cost-effective health interventions: public education campaigns, school WASH programs, and community-led initiatives cost relatively little but yield large reductions in disease. For example, handwashing with soap can cut diarrheal incidence by up to 30-50%, and respiratory infections by around 20%. Central Asian governments, often with UNICEF and World Bank support, are rolling out mass media campaigns and curricula to ingrain these habits. In Uzbekistan, a nationwide handwashing campaign has been implemented to raise the practice rate in rural areas (where coverage of facilities lags behind urban) as per State "Clean Hands" Programme. In Tajikistan, where cultural barriers and resource gaps have kept hygiene levels low, efforts include incorporating hygiene education in schools and providing supplies. It's equally important to address menstrual hygiene management (MHM) and WASH in institutions. Currently, many schools and public facilities lack adequate water, toilets, and privacy for women and girls. (In one assessment, virtually 0% of Tajikistan's schools had proper menstrual hygiene facilities – prompting new programs to upgrade school WASH)[245] Interventions here involve building or refurbishing school toilets, ensuring running water and soap are available, and providing waste bins and education on menstrual hygiene. These improvements are low-cost but have a high impact on girls' school attendance and dignity. Community-based approaches like Community-Led Total Sanitation (CLTS) have also been introduced in parts of the region to eliminate any remaining open defecation and promote collective hygiene norms. Such approaches leverage peer influence and have seen success globally in raising sanitation and hygiene standards at scale.

5.4.4. Optimising the investments

Efficiency in service delivery

This means maximizing coverage and reliability per unit cost. One aspect is **better water utility management** – reducing high water losses (leakages) in urban piped systems. Many Central Asian utilities lose 30-50% of water to leaks; investing in network repairs and modern leak detection is highly efficient, effectively "creating" new supply without new source development. For instance, upgrading pipes in a city like Bishkek or Dushanbe can significantly improve supply continuity at a fraction of the cost of building a new reservoir. Another efficiency measure is integrating services: combining water,

[244] United Nations Economic Commission for Europe. (2024, March 14). *Strengthening action in Uzbekistan on water & sanitation and protection of water resources from accidental pollution in the face of climate change*. Available here.
[245] International Human Rights Law Review, Ibid.

sanitation, and hygiene interventions can yield synergistic effects. For example, when new water taps are installed, simultaneously promoting hygiene and providing pour-flush latrine upgrades ensures that the water is used in a way that maximizes health impact (clean water + sanitation + hygiene together reduce disease far more than any one alone).

Choosing appropriate technology is also crucial for efficiency. Rather than defaulting to the costliest solutions, countries can adopt context-appropriate tech – e.g. solar-powered pumps and gravity-fed village systems instead of diesel pumps that have high operating costs; small-bore sewer systems or condominial sewers in peri-urban areas instead of full-sized expensive sewers. These can provide near-equivalent service at much lower cost and can later be integrated into larger systems. Efficient service delivery also involves demand management: implementing low-cost water meters and tariff reforms to reduce excessive consumption (currently, water is often unmetered and nearly free, leading to inefficiency). By gradually introducing metering, utilities can improve financial viability and incentivize conservation, stretching existing water resources further. **Efficient maintenance** is another point – budgets must allocate funds for operations and maintenance of WASH facilities (fixing pumps, emptying latrines) so that built infrastructure doesn't fall into disrepair. Community-based maintenance models (training local water user associations) have been effective in Kyrgyzstan and Tajikistan, ensuring rural schemes keep running at low cost by utilizing local buy-in. In summary, efficiency in WASH is about smart management and technology choice, preventing resource wastage, and thereby serving more people well with the funds available.

Equity and Inclusion

Even where national averages look good, equity considerations ensure no one is left behind. In WASH, this means focusing on **rural areas, poor communities, and marginalized groups.** The rural-urban divide is striking: rural Tajikistan and Kyrgyzstan have much worse services than cities. Equity demands that investments prioritize these underserved villages – e.g. selecting remote communities for water supply projects even if the per-capita cost is higher than in urban areas. It also means tailoring solutions to affordability: poor households might struggle to pay connection fees for piped water or toilets. Subsidy schemes or microfinance for WASH can help (for instance, a revolving fund to help rural families install septic tanks or household water filters). Gender equity is central in WASH: women and girls bear most of the burden of water collection and suffer most from lack of toilets. Ensuring every school has separate facilities for girls (with menstrual hygiene provisions) by 2030 is an equity goal – this encourages girls' attendance and safety.[246] Similarly, community water points should be in safe, easily accessible locations (considering the needs of women, who fetch water at early/late hours). Equity for people with disabilities means designing infrastructure that is accessible – for example, public latrines with ramps and handrails, and water pumps at heights usable by all. Currently, these considerations are often absent (hence only 3% of schools in Tajikistan had facilities accessible for students with disabilities[247]). A principle of "inclusive design" can be mandated in all new WASH infrastructure. Geographic equity also implies addressing regional disparities: in Kazakhstan and others, some remote provinces (e.g. desert communities in western Uzbekistan or high mountain hamlets in Tajikistan) have far worse WASH access. Governments should map WASH coverage and explicitly aim to bring all regions up to national targets (perhaps by 5-year plans focusing on the lowest-coverage districts first). By embedding equity into WASH planning, Central Asian nations ensure that improvements are shared by all socio-economic groups, thereby maximizing the human capital gains (since the health and productivity of the poorest will improve, reducing inequality).

[246] World Bank. (2023, February 23). *Tajikistan's Education Outcomes to Improve with Support from a New World Bank Project*. The World Bank. Available here.
[247] Ibid

Effectiveness and quality of service

Providing WASH services that are effective means they actually deliver the intended health and comfort benefits – water that is truly safe to drink, and sanitation that actually prevents contamination. This goes beyond just building infrastructure to ensuring it functions to standard. **Water quality monitoring and enforcement** is critical: agencies should regularly test water for microbial and chemical parameters and enforce standards. Where decentralized solutions are used (like household filters), effectiveness requires training users in proper operation and maintenance. For sanitation, effectiveness means not only latrine construction but ensuring the **waste is contained and treated**. One strategy is developing fecal sludge management services as mentioned – having an effective collection system (e.g. vacuum trucks for latrine sludge) and treatment ponds. By 2035, each country could aim for effective treatment of at least 50% of excreta, rising to 100% by 2050.

Behavior change effectiveness is also key: for instance, just building handwashing stations does little if people don't use them. Programs must be grounded in community engagement (like CLTS – Community-Led Total Sanitation – approaches that have successfully changed norms by triggering communities to end open defecation). Central Asia can adapt such approaches to, say, achieve 100% latrine usage and handwashing in every village (in many places open defecation is gone, but latrine maintenance and handwashing need reinforcement).

Another aspect of quality is **service reliability**: water systems must function year-round. Many smaller systems now face seasonal outages or rationing. Effectiveness requires climate-resilient design (e.g. backup water sources for dry seasons, redundancy in pumps) to ensure continuous service. It's also about customer service – setting up channels for communities to report breakdowns and get quick repairs improves users' trust and consistent use of services. In sum, a WASH system is effective when water that comes out of the tap is potable every day and sanitation truly isolates waste from the environment.

Climate Sensitive Adaptations

WASH and the environment are deeply intertwined, especially in Central Asia's challenging geography. Water resources are under stress – the region experiences "water stress" above 70% in many areas, meaning water withdrawal is a large share of availability.[248] Sustainable WASH means using water resources judiciously and protecting ecosystems. One principle is integrated water resource management (IWRM) – coordinating the use of river basins that many Central Asian countries share (e.g. Syr Darya, Amu Darya) so that upstream use (like Tajikistan's hydro or irrigation) doesn't compromise downstream drinking water. At the project level, sustainability calls for exploiting renewable water sources: for example, capturing spring water in mountains or harvesting rainwater can supplement groundwater.

Climate change adaptation is imperative – as glaciers melt, summer flows may diminish, so WASH systems need storage (reservoirs or tanks) to capture excess flow in wet periods for use in dry periods. Efficient appliances (low-flow taps, dual-flush toilets) and reuse of greywater for irrigation can be promoted to conserve water. On the sanitation side, environmental sustainability involves treating wastewater to avoid polluting rivers (which is both a health and ecological hazard). By 2035, countries like Kazakhstan and Uzbekistan aim to significantly upgrade wastewater treatment in cities to reduce contaminants entering water bodies. Additionally, the safe reuse of treated wastewater and sludge can be a win-win – for instance, properly treated sewage effluent can irrigate agriculture, easing pressure on freshwater (already, projects in Uzbekistan are piloting wastewater reuse for green spaces). Fecal sludge from septic tanks can be processed into fertilizer or biogas, as some innovative projects show, turning waste into a resource. Another environmental angle is energy: water supply and treatment can

[248] United Nations. (2020). *The Sustainable Development Goals report 2020*. United Nations. Available here.

be energy-intensive. Wherever possible, WASH systems should use renewable energy (solar pumps, biogas from sewage to power treatment plants). This reduces greenhouse emissions and can be cost-saving in remote areas off the grid. Lastly, community engagement and education about water stewardship ensures sustainability. If communities understand the link between upstream forest conservation and their water supply, they are more likely to support watershed protection (like planting trees to protect springs). By institutionalizing these practices – e.g. requiring environmental impact assessments for all major WASH projects and setting aside funding for source protection – Central Asia can ensure its WASH improvements do not come at the cost of ecological degradation.

5.5. Health and Nutrition

5.5.1. Introduction to the Sector

A health and nutrition system is a coordinated set of policies, programs, services, and interventions designed to promote, protect, and restore nutrition and health throughout the life course. It integrates prevention, care, and treatment across health, food, water, sanitation, education, and social protection systems to ensure that individuals (especially mothers, children, and vulnerable groups) receive the support necessary for optimal growth and development.[249]

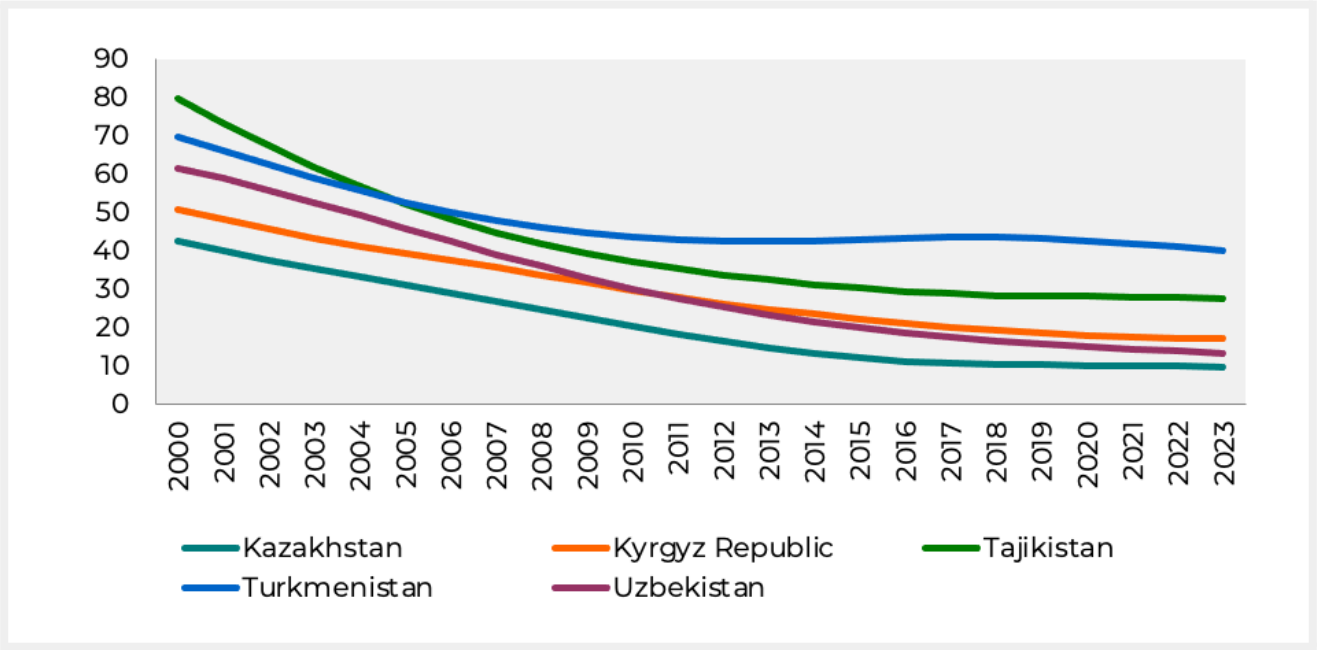
Human development, and therefore the achievement of the demographic dividend, hinges on good nutrition and health from before conception through adulthood. Proper nutrition and health interventions at every stage—periconceptual, pregnancy, childbirth, breastfeeding, infancy, and beyond—are critical for several reasons. Nutrition supports brain and body development, especially during the first 1,000 days (conception to age two), which sets lifelong health, learning, and earning potential.[250] Countries with strong healthcare systems experience better health outcomes, such as reduced child mortality, increased life expectancy, and improved quality of life for women and families.[251] Healthy, nourished individuals learn better, are more productive, and contribute to economic and social progress.[252]

5.5.2. Health and Nutrition in Central Asia

Over the past three decades, Central Asia has made notable progress in reducing child mortality. In 1990, under-five mortality rates in Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan ranged from 53 to over 107 deaths per 1,000 live births.[253] By 2025, projections show these rates will drop dramatically to between 8 and 35 deaths per 1,000 live births. Uzbekistan and Kazakhstan have seen the steepest reductions, reflecting successful investments in maternal and child health.[254] Turkmenistan is projected to have the highest child mortality rates in the subregion *(see Figure 29)*.

[249] UNICEF (2020). Nutrition, for Every Child. Available here.
[250] UAMH (2024) Why nutrition is foundational to development. Available here.
[251] WHO (2024) Primary health care. Available here.
[252] UAMH (2024) Why nutrition is foundational to development. Available here.
[253] United Nations, Department of Economic and Social Affairs, Population Division. World Population Prospects: The 2024 Revision. United Nations, New York, 2024
[254] United Nations Inter-Agency Group for Child Mortality Estimation (UN IGME), Levels & Trends in Child Mortality: Report 2024 – Estimates developed by the United Nations Inter-Agency Group for Child Mortality Estimation, United Nations Children's Fund, New York, 2025.

Figure 30. Estimated under-five mortality rates by country, 1990 and 2025 (per 1,000 live births)



Source: *UN Inter-agency Group for Child Mortality Estimation, UN Children's Fund (UNICEF), uri: childmortality.org*

Expanded immunisation, improved maternal and newborn care, better access to quality primary health services, and progress in water, sanitation, and hygiene have driven these gains. However, despite these achievements, children in Central Asia still face higher risks of dying before their fifth birthday compared to those in Eastern Europe and the Baltic States, where under-five mortality rates have fallen below 10 deaths per 1,000 live births.[255]

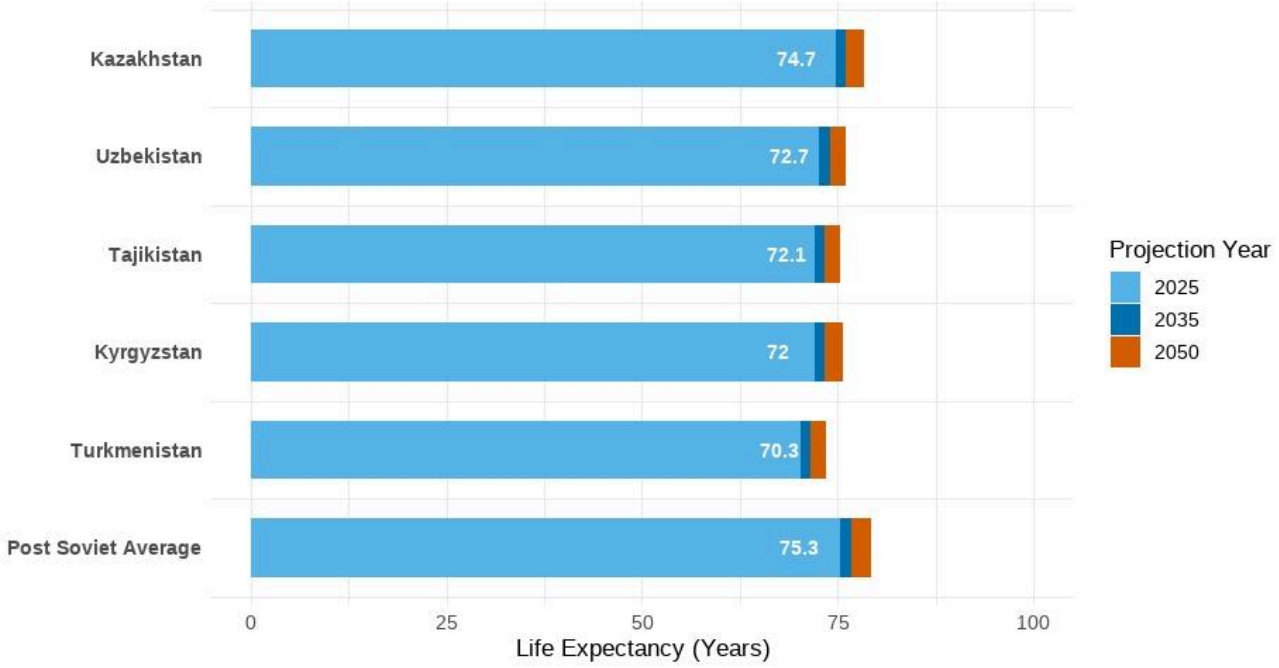
Ending preventable child deaths and narrowing the survival gap requires focusing on the most disadvantaged children, especially those in rural and underserved areas. Strengthening primary health care, addressing malnutrition, ensuring universal access to life-saving interventions, and intersectoral support to families at the community level must remain key regional priorities.[256]

Life expectancy at birth is rising across Central Asia, reflecting gains in child survival. In 2025, newborns in the region are expected to live between 70 and 73 years on average, with Uzbekistan and Kazakhstan recording the highest levels among the five countries. While these improvements are notable, all countries in the region still fall below the post-Soviet average. *(see Figure 30)*.

[255] Ibid

[256] UNICEF Division of Data, Analytics, Planning and Monitoring – Data and Analytics Section, Progress on Children's Well-Being: Centring child rights in the 2030 agenda – For every child, a sustainable future, United Nations Children's Fund (UNICEF), New York, September 2023.

Figure 31. Estimated and Projected Life Expectancy at Birth in Post-Soviet Region (2025-2050)



Source: *UNICEF analysis based on United Nations, Department of Economic and Social Affairs, Population Division, World Population Prospects: The 2024 Revision (UN WPP), United Nations, New York, 2024. Note: Countries are ranked from highest to lowest life expectancy in 2025.*

Looking ahead, all Central Asian countries are projected to experience steady increases in life expectancy. By 2050, average life expectancy could reach up to 77–78 years in the strongest-performing countries, while others may still lag just under 75 years. But without stronger, more equitable health systems, these gains may be uneven—leaving behind communities most affected by poverty, migration, environmental risks, and non-communicable diseases.

Sustaining progress will require coordinated action to improve access to quality care, especially in rural and marginalised areas.[257] This includes prioritising newborn and child health as well as adolescent and maternal health, addressing the growing burden of chronic illnesses, and building resilience to environmental and economic shocks. A future where every child and every adult can survive and thrive depends on continued investments in health, equity, and social protection.

5.5.3. Proposed intervention scale ups by 2050

Interventions that are demonstrated to be cost-effective and are applicable for the Central Asian context include those which focus on preventing child mortality and morbidity by preventing and treating common illnesses and promoting optimal healthy development. They are foundational public health measures for improving survival and well-being, and ensuring that every child has the opportunity to reach their full health potential.[258]

To foster human capital development, and therefore the demographic dividend, it is imperative that Central Asian nations prioritize cost-effective, proven interventions in the health and nutrition sector. Analysis of coverage in key interventions demonstrates that some countries are nearing universal

[257] Gizaw Z, Astale T, Kassie GM. What improves access to primary healthcare services in rural communities? A systematic review. BMC Prim Care. 2022 Dec 6;23(1):313. doi: 10.1186/s12875-022-01919-0. PMID: 36474184; PMCID: PMC9724256.

[258] It is important to note that there are a range of interventions which are critical for the health and nutritional wellbeing of populations. The ones that are subject to this study are those which are proven to be cost-effective and where data was available across all Central Asian countries.

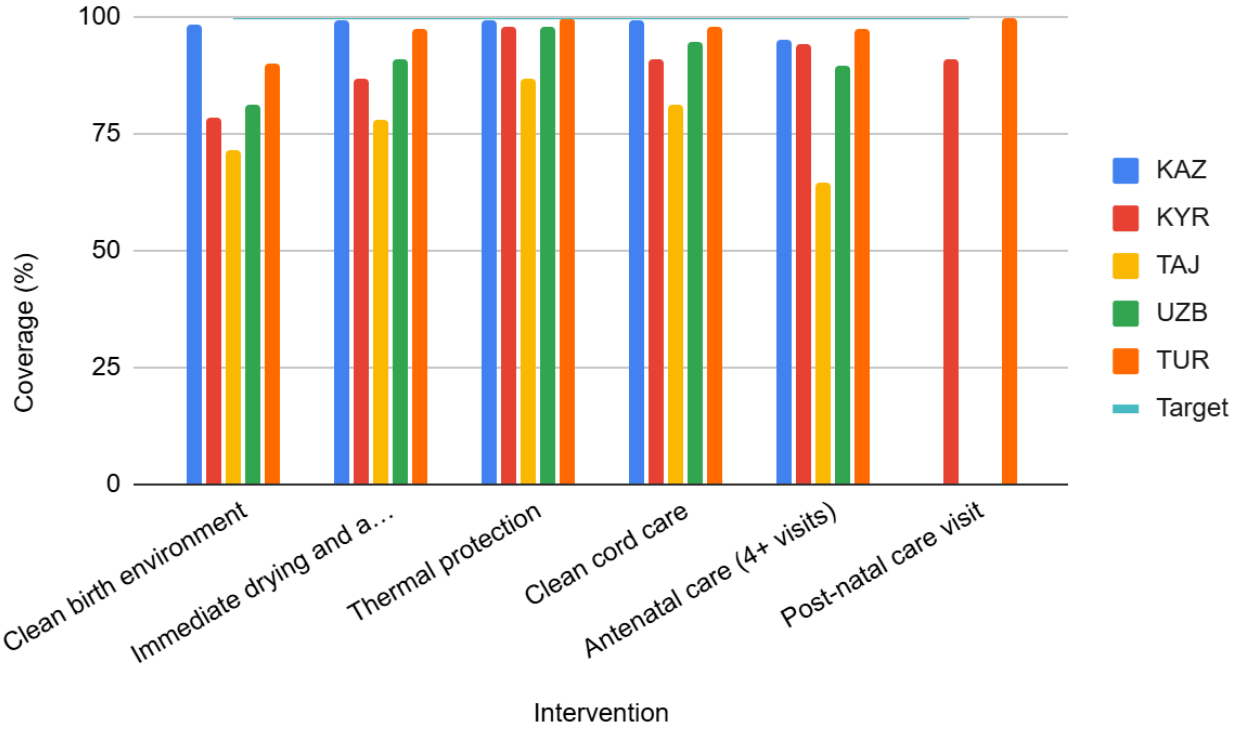
coverage in certain areas while others lag significantly behind, underscoring the need for investments to bridge these disparities. The ultimate goal is to ensure that every child has access to essential health and nutrition services, thereby laying a solid foundation for their future well-being and productivity.

Several key areas have been identified for targeted interventions to be implemented by 2035, with each addressing critical gaps in the current health and nutrition framework. All interventions included below, including baseline coverage data, were derirved from the Lives Saved Tool (LiST).[259] LiST is a widely used modeling tool in the global health community. It was developed by Johns Hopkins University, with guidance from the World Health Organization (WHO) and UNICEF. Full definitions for each intervention are included in Annex 3: Health and Nutrition Sector Intervention Definitions.

Maternal and newborn health

Interventions which focus on maternal and newborn cases focus on ensuring the health and survival of mothers and their babies around the time of birth. These include antenatal care postnatal care, ensuring a clean birth environment, immediate drying and additional stimulation, thermal protection, and clean cord care.

Figure 32. Maternal and newborn health interventions



In the realm of maternal and newborn care, ensuring a clean birth environment is fundamental to reducing neonatal mortality. While Kazakhstan has achieved near-universal coverage at 98.3%, other nations such as Kyrgyzstan and Tajikistan, with coverage at 78.7% and 71.5% respectively, have considerable ground to cover to meet the 100% target. Similarly, interventions like immediate drying and stimulation, thermal protection, and clean cord care are critical for newborn survival. Most countries in the region have made significant strides in these areas, but a concerted push is needed to reach universal coverage. Furthermore, while most countries are nearing the 100% target for at least

[259] The Lives Saved Tool. Available at: https://list.spectrumweb.org/

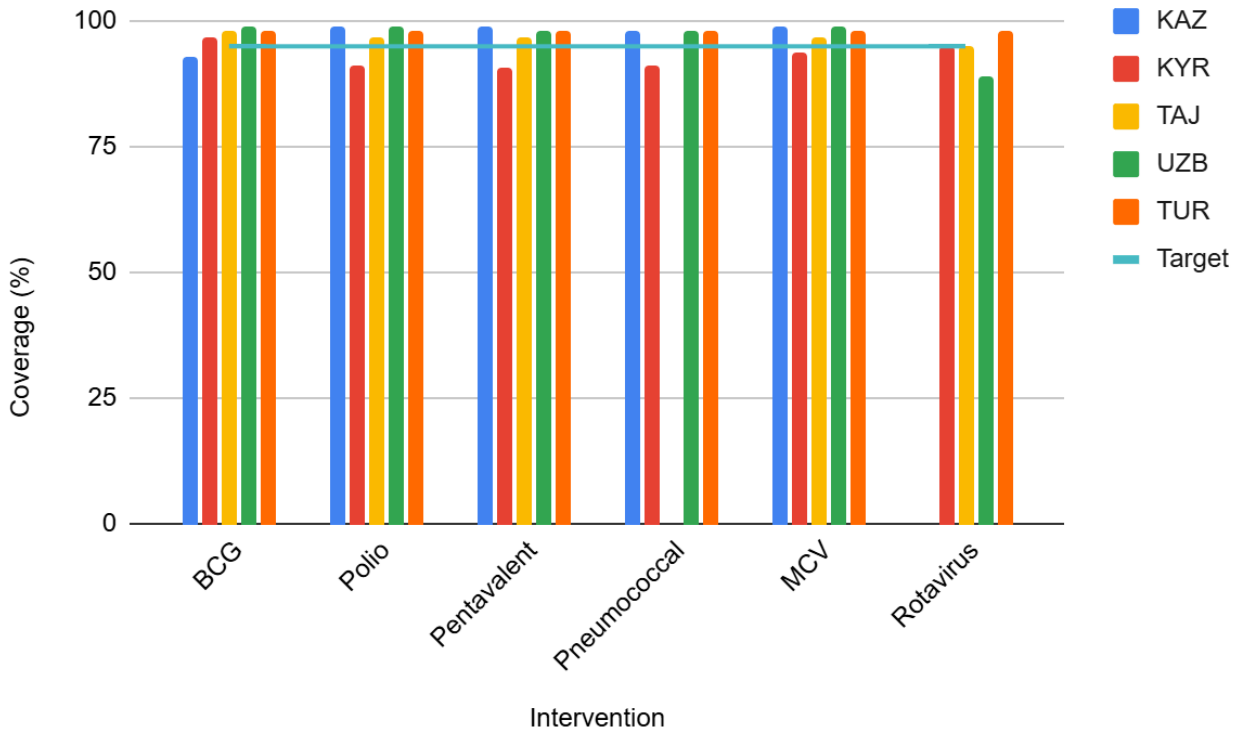
four antenatal care visits, Tajikistan's coverage is notably lower at 64.6%, highlighting a critical need for investment in maternal health services.

Childhood vaccinations

Secondly, childhood vaccinations are a highly effective way to prevent infectious diseases that cause significant illness and death in children. This includes BCG, polio, DPT, Hepatitis B, Pneumococcal, and measles.

The region has shown a strong commitment to childhood immunization, a cornerstone of public health. For the BCG, Polio, DPT, H. influenzae b, HepB, and Measles vaccines, the majority of countries have either met or are close to the 95% coverage target. However, some disparities remain. For instance, in Kyrgyzstan, the coverage for the Polio, DPT, H. influenzae b, and HepB vaccines hovers around 90-91%, indicating a need to strengthen immunization programs to reach the most marginalized communities. Notably, there is no data available for the Pneumococcal vaccine in Tajikistan, pointing to a potential gap in the national immunization schedule.

Figure 33. Childhood vaccines

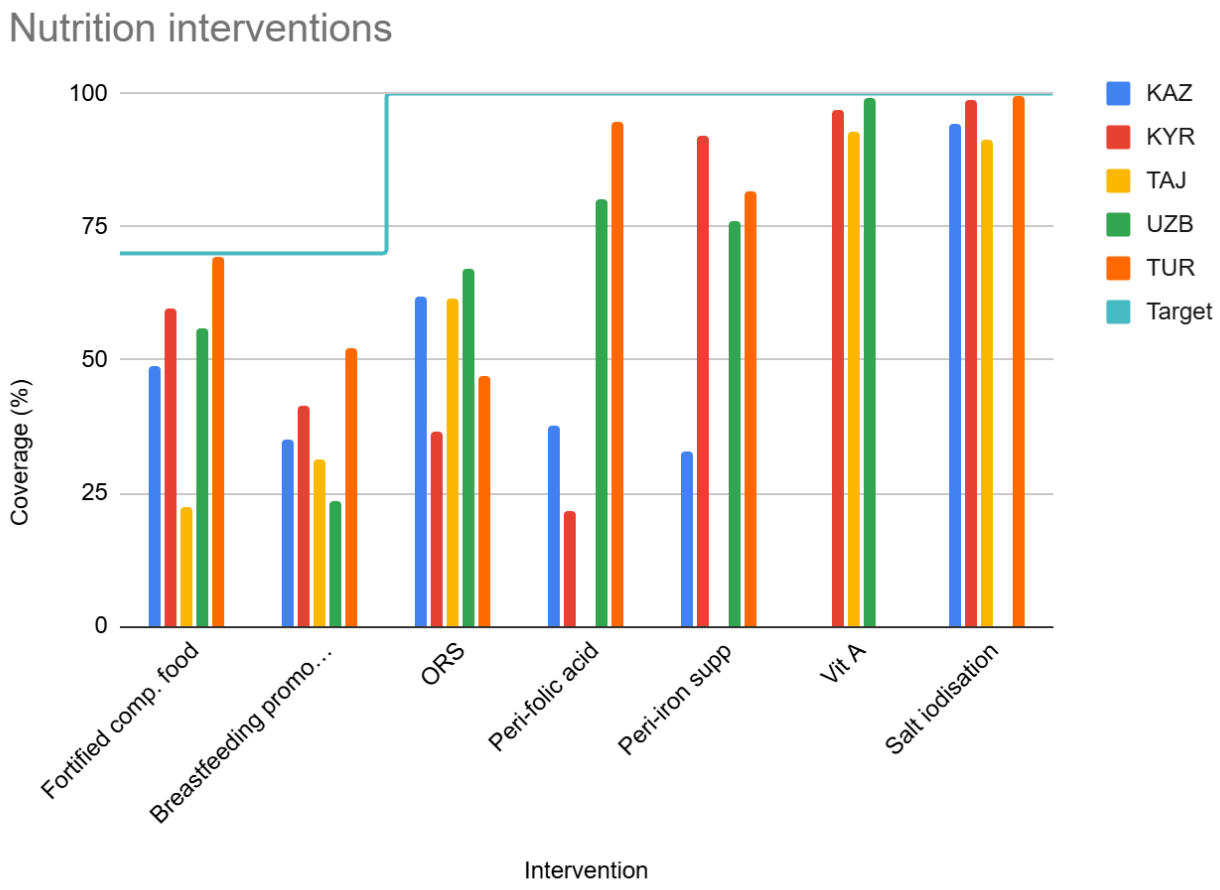


Nutrition interventions

Finally, proper nutrition and basic treatments are also crucial for child survival and health development. This includes ORS (oral rehydration solution), promotion of breastfeeding, provision of appropriate fortified complementary food, periconceptual folic acid and iron supplementation, vitamin A supplementation, and salt iodisation. Other nutrition interventions, such as multiple micronutrient powders for children, deworming, and zinc for management of diarrhea therapeutic feeding for malnourished children are all also critical interventions to support the immediate and underlying causes of malnutrition. However, these have not been included in the costing and scale-up scenarios given the lack of robust and directly comparable data across the Central Asian region for these interventions

In the domain of nutrition, significant challenges persist across Central Asia. The promotion of breastfeeding is a highly effective intervention to improve child health and development, yet no country in the region is close to the 70% target, which reflects the SDG target on exclusive breastfeeding.[260] Turkmenistan has the highest rate at 52.3%, while Uzbekistan lags behind at just 23.7%. Similarly, the provision of appropriate fortified complementary foods for food-secure populations could be improved across the board, particularly in Tajikistan, which stands at 22.5%. This highlights a critical need for investment in nutrition education and support for mothers and families. Oral Rehydration Solution (ORS) to treat childhood diarrhea is another area that requires attention. While Uzbekistan, Tajikistan, and Kazakhstan have coverage rates over 60%, Kyrgyzstan and Turkmenistan are significantly behind at 36.4% and 47.1% respectively, falling far short of the 100% target. The picture is also mixed for periconceptual folic acid and iron supplementation, with countries differing significantly in the level of coverage.

Figure 34. Nutritional interventions



5.5.4. Optimising the investments

Achieving universal access to high-quality health and nutrition services is fundamental for building human capital in Central Asia. While regional data shows progress in areas like childhood

[260] Definition of breastfeeding promotion: Percentage of children whose mothers receive activities designed to promote breastfeeding. Breastfeeding promotion can either be one-on-one or group meetings. Promotion activities can take place within the health system, at the home/community level, or both. Percentage of children whose mothers receive activities designed to promote breastfeeding. Breastfeeding promotion can either be one-on-one or group meetings. Promotion activities can take place within the health system, at the home/community level, or both.

immunization, significant gaps in service quality, equity, and efficiency remain. However, investing in these services is not just about increasing coverage. Incorporating technology can ensure investment efficiency, environmental sustainability of investments must be considered, and equity considerations must ensure that the most vulnerable children are not left behind.

The Role of Technology in Service Delivery

Modernizing health and nutrition services through technology is a high-impact, cost-effective strategy. Digital tools can enhance the efficiency of health workers, improve data collection for better decision-making, and expand access to care, particularly in remote regions.

Currently, many health systems rely on paper-based records, leading to inefficiencies in tracking patient care and monitoring public health trends. In Uzbekistan, for example, where only 81.3% of births occur in a clean environment and ORS coverage for diarrhea is at 67.2%, a centralized digital health information system could be transformative. Such a system can track immunization schedules for individual children, send automated reminders to parents via SMS, and provide real-time data on supply levels for essential medicines like vaccines and ORS at local clinics. This helps prevent stockouts and allows for targeted outreach to families who have missed appointments.

Strengthening the skills of the health workforce is critical, mirroring the need to professionalize the social service workforce. E-learning platforms can provide continuous professional development for doctors, nurses, and community health workers across vast geographic areas. In Tajikistan, where antenatal care coverage is low at 64.6%, e-learning modules could update healthcare providers on the latest global standards for maternal care. Furthermore, telemedicine consultations can connect primary-level health workers in rural areas with specialists in urban centers, improving the quality of diagnosis and treatment for complex cases without requiring families to travel long distances. Kyrgyzstan introduced telemedicine in its primary healthcare (PHC) system to improve access to specialized care for rural and remote populations. The initiative, supported by organizations like UNICEF and the WHO, involves a mobile app called TeleMed.Kg and is being implemented in pilot regions like Nookat and Suzak.[261]

Climate-Sensitive Adaptations

Climate change poses a significant threat to health and nutrition outcomes in Central Asia. Increased frequency of extreme weather events like floods and droughts can damage health infrastructure, contaminate water sources, and disrupt food supplies, reversing hard-won gains.

Climate change is expected to increase the incidence of water-borne diseases. In Tajikistan, where only 22% of the rural population has access to piped water, investments in climate-resilient water systems are crucial for public health. This includes constructing flood-proof wells, protecting springs from contamination, and expanding safely managed water and sanitation infrastructure. These adaptations directly support health by reducing the burden of diarrheal diseases, which is essential given the low ORS usage in some countries.

Droughts and changing weather patterns threaten agricultural productivity, which can worsen malnutrition. To counter this, interventions should promote climate-resilient food sources and fortify staple foods. This is especially critical in Tajikistan, where only 22.5% of children receive appropriate fortified complementary foods. Promoting drought-resistant crops and supporting national food fortification programs can ensure a stable supply of micronutrients, protecting children from the long-term consequences of malnutrition.

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[261] UNICEF (2022) Kyrgyzstan: Improving family health through telemedicine. Available at: https://www.unicef.org/innovation/dpg-pathfinding-countries/kyrgyzstan#:~:text=Telemedicine%20is%20being%20deployed%20in%20Kyrgyzstan's%20primary,*%20Strengthen%20infrastructure%20*%20Prioritize%20digital%20health

Effectiveness and quality of service

Moving beyond simple coverage numbers to focus on the quality of care is essential for improving health outcomes. A patient can attend a clinic but receive substandard care due to a lack of trained personnel (or an outflow of trained personnel to other countries), missing supplies, or poor protocols.

The effectiveness of immunization programs depends on a reliable "cold chain" to keep vaccines at the correct temperature. Investing in modern, solar-powered refrigerators for rural clinics and using digital inventory management systems can significantly improve the reliability and efficiency of the vaccine supply chain, ensuring every child receives potent vaccines.

Low breastfeeding rates across the region, such as 31.4% in Tajikistan and 23.7% in Uzbekistan, are often linked to healthcare providers lacking the time or training to counsel new mothers effectively, as well as lack of awareness raising at the community level. Quality improvement initiatives can address this by implementing peer-mentoring programs for health workers, introducing standardized counseling checklists, and creating "baby-friendly" hospitals that institutionalize support for breastfeeding. This focus on professional development and standardized practice echoes the successful strategy of strengthening the social service workforce.

Equitable Distribution of Investment

National averages often mask deep inequalities in health and nutrition outcomes. Strategic investments must be targeted to address disparities based on geographic location, gender, socio-economic status of the families, educational status of mothers and disability status to achieve universal access to protective services.

As with social services, healthcare workers and infrastructure are often concentrated in urban centers, leaving rural populations underserved. In Kyrgyzstan, where 78.7% of births occur in a clean environment, this figure is likely much lower in remote rural areas. To close this gap, investments are needed to build and equip rural health clinics and provide financial incentives and housing support to attract and retain skilled health professionals, particularly midwives and nurses with task shifting from family doctors to them, in these underserved regions.

Achieving universal coverage requires proactively reaching the most marginalized. For children with severe disabilities, standard immunization services may be inaccessible. Kazakhstan and Kyrgyzstan, which have achieved universal social protection coverage for persons with severe disabilities, can serve as models. Health systems should adopt a similar inclusive approach by funding mobile immunization teams to visit home-bound children. Furthermore, improving menstrual hygiene management (MHM) in schools and health facilities by building appropriate toilets and providing education is a low-cost, high-impact investment that supports girls' dignity and school attendance.

5.6. Youth Employment

5.6.1. Introduction to the Sector

The youth employment sector consists of a coordinated system of policies, institutions, programs, and market mechanisms supporting young people—typically aged 15 to 24—as they transition from education to productive participation in the labor market. Its key components include quality education and skills development, vocational training, employment services (including job matching, placement, and career guidance), entrepreneurship initiatives, and labor market regulations.[262] These elements operate together to provide youth with the skills, resources, and opportunities needed to access decent work in a changing economic environment.[263]

[262] UNICEF (2021) "Reaching YES - Addressing the youth employment and skilling challenge". Available here.
[263] UNFPA (2025) Meta-Synthesis: "Rights and Voices of Youth – in Education and Employment?"

Effective youth employment systems require collaboration between government, private sector, educational institutions, and civil society, ensuring interventions are inclusive, responsive to market needs, and tailored to address barriers faced by vulnerable groups.[264] UNICEF and its partners emphasize the importance of programs that combat gender disparities and social exclusion, adapt to technological changes, and harness opportunities linked to digital transformation and environmental sustainability.[265]

Investing in youth employment is crucial for achieving the demographic dividend. Reducing youth unemployment and underemployment raises productivity, improves incomes, and supports social stability—a central outcome for achieving the Sustainable Development Goals. Conversely, neglecting youth employment can result in lost economic opportunities and heightened social vulnerabilities.[266]

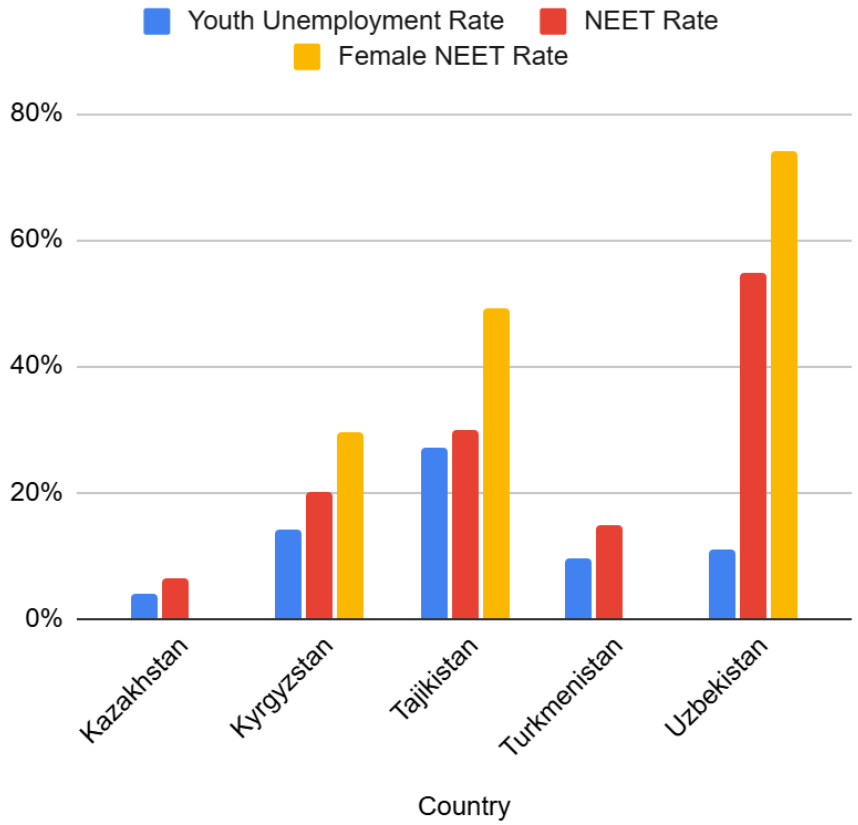
5.6.2. Youth Employment in Central Asia

In Central Asia, the youth unemployment rate fell from 17.7% in 2019 to 13.8% in 2023, with projections of 13.4% for 2024.[267] The youth NEET rate in the sub-region also declined from 21.3% in 2019 to 18.6% in 2023.[268] The International Labour Organization (ILO) attributes this sharp decline in part to external factors, including an increased demand for young workers as production shifted to offset losses in Eastern Europe and significant out-migration of young people to the Russian Federation.[269] This suggests the recovery is fragile and highly dependent on geopolitical and economic factors outside the region's control, creating a risk of long-term precarity if domestic job creation is not strengthened.

Beneath these regional averages lie gender inequalities. While a gender gap in youth unemployment exists, it is the NEET rate that reveals the true scale of inequality. Across Central Asia, the female NEET rate stood at 24.1% in 2023, nearly twice as high as the male rate of 13.4%.[270] This disparity is directly linked to the disproportionate burden of unpaid domestic and caregiving responsibilities placed on young women, which limits their ability to pursue education or formal employment.

[264] UNICEF (2021) "Reaching YES - Addressing the youth employment and skilling challenge". Available here.
[265] Ibid
[266] Ibid
[267] ILO (2025) Global Employment Trends for Youth 2024 Europe and Central Asia. Available here.
[268] Ibid
[269] Ibid
[270] Ibid

Figure 35. Youth unemployment and NEET rates



Source: *Various national and international datasets (national datasets preferred where available), aged 15-24 or closest available age category, latest year.*

Kazakhstan reports the lowest official youth unemployment rate in the region, at 3.8% for 15-24 year-olds in 2024, and a NEET rate of 6.4% for the 15-34 age group. However, these positive figures mask underlying challenges of skills mismatch, a rigid labour market, and concerns about the quality of employment, with a large number of young people classified as self-employed, which can be a precarious status.[271]

A high youth unemployment rate of 14.2% in Kyrgyzstan is compounded by a severe gender disparity in the NEET rate, which stands at 29.4% for young women versus 12.0% for young men.[272] This is driven by a significant mismatch between the education system and labour market demands, alongside high levels of informality, where an estimated 79% of employed youth work without formal contracts or social protection.[273]

In Tajikistan, the youth unemployment rate reached 27.1% in 2024. The situation for young women is worse; the female NEET rate is nine times higher than the male rate, with women accounting for approximately 90% of all youth who are NEET.[274] These outcomes are fueled by limited educational and economic opportunities, particularly in rural areas where 70% of the population resides.[275]

Official statistics for Turkmenistan report a youth unemployment rate of 9.6% for 2024 and a NEET rate of 14.7%.

[271] Doskoyeva (2021) Assessment of the current status of youth employment in Kazakhstan and the system of its state support. Available here.
[272] UNICEF (2025) Kyrgyzstan. Adolescents and youth. Available here.
[273] Ibid
[274] UNICEF (2025) Tajikistan: Second decade. Available here.
[275] UNICEF (2025) Tajikistan: Second decade. Available here.

Uzbekistan's youth unemployment rate of 10.9% is overshadowed by a gender gap in the NEET rate for 19-30 year-olds: 74.0% for women compared to just 24.8% for men.[276] This significant disparity points to deeply entrenched social norms and structural barriers that effectively push the majority of young women out of the economy after they complete their education.

According to the 2025 Future of Jobs report, AI and big data are among the top skills expected to increase in use in Central Asia by 2030, with a net difference of 79% of employers foreseeing a rise in their importance.[277] 32% of employers in Central Asia currently consider AI and big data as a core skill for their workforce, and companies in the region are planning to invest in AI, robotics, and energy technologies. The demand for these skills is also reflected in the types of jobs expected to grow in the region. For instance, in Kazakhstan, roles such as Big Data Specialists and AI and Machine Learning Specialists are projected to be among the fastest-growing.

Despite the clear demand, a significant challenge remains in equipping the workforce with these necessary skills. In Kazakhstan, for example, seven in ten firms identify skills gaps in the labour market as a primary concern.[278] Similarly, in Uzbekistan, there is a strong need for reskilling and upskilling the current workforce to meet evolving demands, with only a fraction of workers expected to receive the necessary training in their current roles. To address this, 52% of employers in Uzbekistan plan to implement strategies for reskilling their workforce to work alongside AI.

5.6.3. Proposed intervention scale ups by 2050

Interventions geared towards reducing the rate of youth not in employment, education, or training (NEET) are varied and many of the interventions discussed in the other sections of this report would achieve this. This includes in the education section and the social protection sections in particular. Interventions that do not fall into these categories are "labour market measures" or specifically "active labour market measures" (ALMMs).

All five Central Asian countries have implemented Active Labour Market Policies (ALMPs) to address youth employment challenges. These interventions typically include skills training, entrepreneurship support, wage subsidies for employers, and public employment services (PES).[279] National strategies and flagship programs are in place, such as Kazakhstan's "Youth Practice" program, Uzbekistan's "Youth is Our Future" state fund, and various initiatives in Kyrgyzstan and Tajikistan.[280]

Since ALMMs vary significantly according to the context, group of focus, and motivations, it is not possible to establish a baseline for scale ups of ALMMs. We therefore assume a coverage rate of zero for each Central Asian country for two ALMMs that have been identified as cost-effective and aligned with country priorities: 21st century skills development programmes and start up grants. It is proposed that 20% of registered unemployed youth enroll in21st century skills development programme, and financial and equipment grants are provided for 5% of youth operating startup businesses.

Effective career guidance systems would maximize the impact of skills training and entrepreneurship support.[281] Key initiatives could include: Internships and on-the-job training (formal partnerships with the private sector to provide real-world work experience), job shadowing and mentorship (connecting students and job seekers with professionals in high-growth fields to provide insight and guidance), and labour market information systems (providing accessible, up-to-date information on in-demand skills and career pathways). These initiatives would support in equipping young people with the

[276] UNICEF (2020) Youth of Uzbekistan: Challenges and Prospects. Available here.
[277] World Economic Forum (2025) Future of Jobs Report. Available at: https://reports.weforum.org/docs/WEF_Future_of_Jobs_Report_2025.pdf
[278] Ibid
[279] ETF (2014) Active Labour Market Policies With A Focus On Youth. Available here.
[280] Islamic Development Bank (2019) Country Youth Profile: Kazakhstan. Available here.
[281] Cedefop (2011) Guidance supporting Europe's aspiring entrepreneurs. Available at: https://www.cedefop.europa.eu/files/5514_en.pdf

practical experience and market awareness required to make informed career choices and succeed in the labour market.

5.6.4. Optimising the investments

To effectively tackle youth unemployment, proposed interventions must be designed for maximum efficiency, equity, and long-term sustainability.

Achieving Efficiency in Programme Delivery

Current approaches to youth unemployment in Central Asia are often fragmented, with various small-scale initiatives operating in isolation. This leads to high administrative overhead, duplication of effort, and a confusing landscape for young job seekers. The proposed interventions can overcome these inefficiencies if implemented strategically.

A key to efficiency is creating a unified digital portal for both the 21st century skills training programme and the startup grants. Instead of inefficient, paper-based application processes scattered across different ministries, a "one-stop" online system would allow youth to register, submit applications, track their status, and receive payments. In Kazakhstan, which has a relatively strong social protection infrastructure, such a platform could be integrated with existing social assistance databases to automatically identify and pre-qualify eligible youth, drastically reducing administrative costs and processing times. This system would also generate real-time data on enrolment and disbursement, allowing for dynamic programme management and transparent monitoring.

For the startup grant scheme, establishing a centralized procurement process for common equipment can create significant cost savings. For instance, if groups of youth in Uzbekistan are starting businesses in similar sectors like textiles or small-scale agriculture, the government can negotiate bulk purchasing agreements for sewing machines or farming tools, providing higher-quality equipment at a lower cost than if each grantee purchased it individually.[282] Partnering with private sector associations and microfinance institutions to deliver the grants and mentorship can also leverage existing expertise and infrastructure, making the programme more efficient than building a new delivery mechanism from scratch.

Guaranteeing Equity in Access and Opportunity

National unemployment figures can hide deep inequalities affecting marginalized youth. To be effective, both interventions must incorporate specific mechanisms to ensure equitable access for young people regardless of their gender, location, or disability status.

Youth in rural and remote areas often face the greatest barriers to employment. To counter this, a portion of the skills training slots should be reserved for these regions. This can be achieved through mobile training units, subsidized internet access for online learning platforms, and targeted outreach campaigns through community leaders to ensure support is not concentrated in capital cities. In Tajikistan, public works projects could be focused on improving local infrastructure like rural water systems or rehabilitating community buildings, creating jobs where they are needed most. For startup grants, setting regional quotas and launching targeted outreach campaigns through community leaders can ensure that entrepreneurial support is not concentrated solely in capital cities like Dushanbe or Bishkek.

Addressing gender disparities and including youth with disabilities is critical to ensuring equity in employment outcomes. To address gender disparities and include youth with disabilities. To address gender disparities, social and behavioural change programs could challenge restrictive gender norms

[282] We note that Uzbekistan has a number of startup grants such as 1. President Tech Award - https://awards.gov.uz/, 2. Startup Base - https://startupbase.uz/en, 3. Startup garage - https://startupgarage.uz/

that limit female participation in the workforce, and girls-focused skilling initiatives in non-traditional, high-growth sectors such as STEM, IT, and green energy could be introduced. Following inclusive models in Kazakhstan and Kyrgyzstan, special consideration could be given to proposals from youth with disabilities. This includes providing additional funding for assistive technology or adapting training modules, ensuring that skills development and entrepreneurship are viable paths for everyone.

Building Long-Term Sustainability

The skills development programs must be directly relevant to the future economy and enhance climate resilience. For example, youth in Kyrgyzstan could be trained in sustainable tourism, digital marketing, or the maintenance of renewable energy systems. This focus prepares them not only for the domestic market but also for evolving labor demands in migrant destinations like Europe and Russia. Each participant should receive a "skills passport" documenting their competencies, making them more competitive in the formal job market.

For the startup grants to have a lasting impact, they must be embedded within a broader supportive ecosystem. Financial capital alone is often insufficient. The programme's sustainability will depend on pairing the grants with mandatory business mentorship from experienced local entrepreneurs, financial literacy training, and assistance with market access. In Uzbekistan, which needs to create over 20,000 new social service jobs, a similar focus on human capital can be applied to business. By connecting new youth-led businesses to larger supply chains and export markets, the government can significantly increase their survival rate beyond the initial grant period, fostering a new generation of job creators and contributing to a more dynamic and diversified economy.

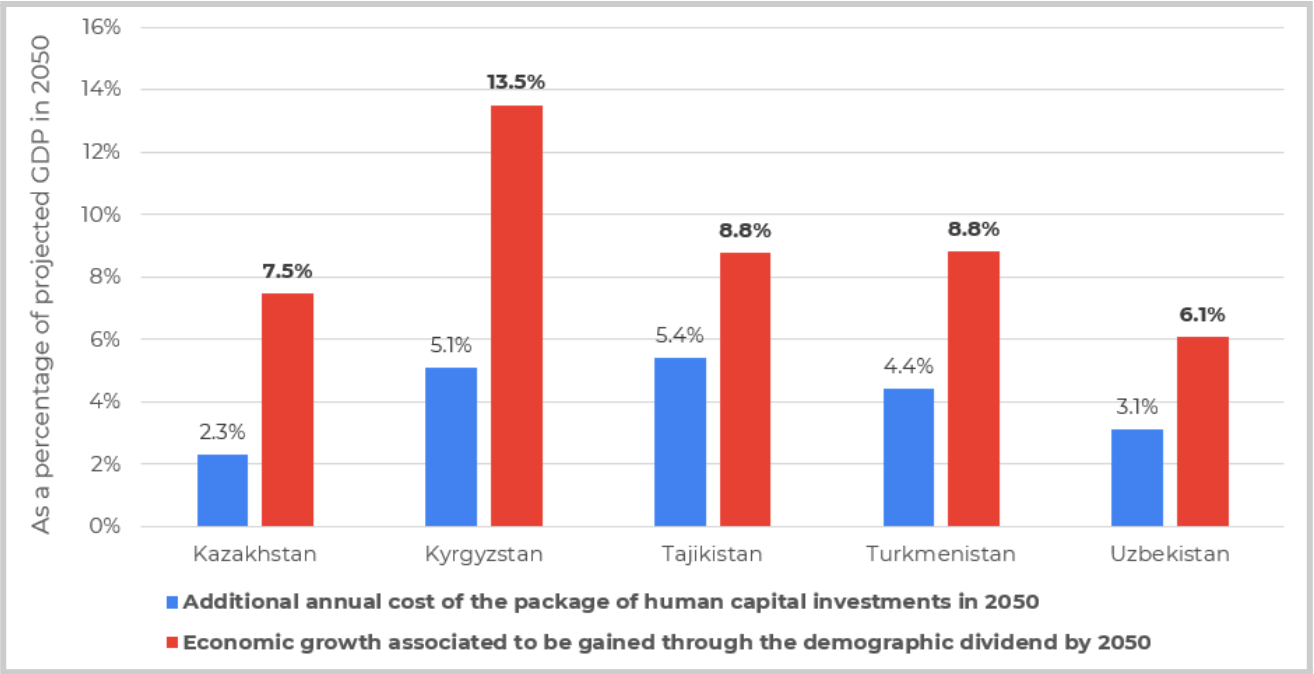
6. Macroeconomic Implications

This report and the associated country annexes consider the prospective costs of scaling up investments and the corresponding economic returns of unlocking the demographic dividend. Whilst the methods are elaborated in the below sections and annexes, we report here on the headline macroeconomic implications:

The potential for investments in human capital formation to drive growth through a multiplier effect on the economy is consistent across all five countries in Central Asia (Figure 1). The estimated size of the multiplier effect – i.e., the ratio of economic returns to the costs of investments – ranges from 1.6 to 3.2. This indicates that each country has a critical window of opportunity in their development, in which prioritising human capital investments through social sector upgrading can help to drive and sustain economic growth. Regarding the relative costs of the scale-up of investments in each country, there is a broad negative correlation such that countries with lower baseline coverage of key social sector services as of 2025 face higher relative costs, as would be expected. The differential economic returns to these investments are elaborated in the below section 'The role of human capital in achieving the demographic dividend'.

The demographic transition taking place in the region demands that human capital investments are scaled up quickly, or else each country risks forgoing significant economic returns. Elaborated in the respective country annexes, we consider the affordability of the necessary human capital investments through a fiscal space analysis (FSA) conducted for each country. Some key takeaways for each country are as follows:

Figure 36. Projected macroeconomic implications of the costs and returns associated with unlocking the demographic dividend through human capital investments, as a percentage of gross domestic product (GDP) in 2050



Kazakhstan: In Kazakhstan, the combination of efficiency gains, domestic revenue mobilisation, and private sector financing could temporarily close the financing gap between 2026 and 2028. However, a new gap is projected to emerge from 2029 onwards, driven by rising service delivery costs due to inflation, demographic growth, and expanded coverage. Efficiency gains represent the largest source of potential fiscal space—accounting for approximately 52 percent of additional resources—reflecting

the significant inefficiencies that persist within the public financial management (PFM) system and state-owned enterprises (SOEs). Private sector financing, including Public–Private Partnerships (PPPs), green and social bonds, and carbon pricing initiatives, contributes about 30 percent of additional revenues in the medium term, while domestic revenue mobilisation (DRM) through tax reforms could yield 18 percent. Although the new tax code reforms hold promise, their impact will depend on effective tax administration and institutional reforms.

Kyrgyzstan: In the Kyrgyz Republic, the combination of fiscal reforms and innovative financing could close the financing gap between 2026 and 2028, though fiscal pressures are expected to re-emerge beyond 2029. Domestic revenue mobilisation (DRM) presents the single largest opportunity, accounting for approximately 64 percent of potential fiscal space. Comprehensive tax policy and administrative reforms—including broadening the VAT base, rationalising tax incentives, introducing a progressive personal income tax, and taxing the digital economy—could generate up to 4.5 percent of GDP annually. Efficiency gains represent another significant source of fiscal space, contributing around 21 percent, mainly through the rationalisation of SOE expenditures and the phased removal of energy subsidies. Private sector financing, through PPPs and the development of green and social bonds, contributes roughly 15 percent, underscoring the growing potential of blended finance in the country's fiscal strategy.

Tajikistan: Tajikistan's fiscal space analysis indicates substantial potential to narrow its financing gap through a mix of domestic revenue mobilisation, efficiency improvements, and transitional external financing. DRM stands as the primary and most sustainable source of fiscal space, contributing about 61 percent of the total. If implemented effectively, reforms aimed at broadening the tax base, rationalising exemptions, and improving compliance could generate as much as 7.2 percent of GDP annually. External financing, particularly Official Development Assistance (ODA), plays a vital though diminishing role, accounting for roughly 26 percent of the available fiscal space in the medium term. Efficiency gains from expenditure rationalisation and energy subsidy reforms account for around 13 percent of total fiscal space, while private and innovative financing—such as PPPs and green bonds—remain modest contributors.

Turkmenistan: A combination of fiscal and structural reforms could reduce the financing gap to as little as two percent by 2030. Efficiency gains present the most immediate opportunity, contributing over 41 percent of total additional resources, primarily through SOE reform, subsidy rationalisation, and improved expenditure management. Domestic revenue mobilisation has significant potential in the medium term, contributing nearly 39 percent—equivalent to about 2.8 percent of GDP annually—through broadening the VAT base, introducing a progressive PIT, and strengthening digital tax administration. Private sector and innovative financing mechanisms, including PPPs and green bonds, account for the remaining 20 percent. However, the realisation of these opportunities depends heavily on improving fiscal governance and resolving macroeconomic distortions such as the multiple exchange-rate system.

Uzbekistan: Uzbekistan's fiscal space projections indicate that the combination of efficiency gains, DRM, and external inflows can fully eliminate the baseline financing gap between 2026 and 2030, generating a temporary fiscal surplus. Efficiency gains contribute the largest share (43 percent), reflecting the potential from SOE reform, better public investment oversight, and energy subsidy rationalisation. DRM accounts for 35 percent and provides the most sustainable long-term revenue source, while external financing—including remittances—contributes 22 percent but remains volatile. The country's growing off-balance-sheet liabilities from SOEs and PPPs, however, pose a significant risk to fiscal sustainability and limit room for new borrowing.

6.1. Recommendations for fiscal space creation

- **Strengthen Domestic Revenue Mobilization:** Broaden the tax base by rationalizing exemptions, improving compliance, and taxing emerging sectors such as extractives, digital services, and carbon-intensive industries. Enhance non-tax revenues through better management of state assets and dividends from SOEs.
- **Improve Spending Efficiency and Fiscal Discipline:** Prioritize value for money by embedding performance-based budgeting, rationalizing subsidies, and strengthening expenditure reviews. Reinforce audit and procurement systems to curb waste and increase accountability.
- **Scale Up Innovative and Green Financing:** Develop regulatory frameworks for green, social, and sustainability bonds to attract private capital. Introduce carbon pricing or emission trading schemes to generate new fiscal revenues while advancing climate goals.
- **Leverage Private Sector Participation:** Strengthen public investment management and expand well-structured PPPs in infrastructure, energy, and service delivery. Establish regional PPP knowledge platforms to share models and lower transaction costs.
- **Enhance Debt and Fiscal Risk Management:** Adopt medium-term fiscal frameworks, improve debt transparency, and build fiscal buffers. Regional collaboration on debt data and risk assessment can strengthen access to concessional financing.
- **Promote Regional Cooperation for Resilience:** Pool efforts to address shared risks—climate shocks, remittance volatility, and narrow export bases—through regional funds, joint procurement, and harmonized investment frameworks. Collective engagement with IFIs can unlock blended finance.
- **Strengthen Data, Capacity, and Policy Coherence:** Invest in integrated fiscal data systems and build analytical capacity within finance ministries. Improve coordination across fiscal, economic, and environmental agencies to align policy and financing priorities.

7. Conclusion

Central Asia stands at a pivotal demographic moment. With a large and youthful population, the region has a unique, time-sensitive window to harness a demographic dividend that could drive substantial economic growth and social development, significantly shortening the journey of Central Asian countries towards achieving high-income status. This report has demonstrated that the transition to a larger working-age population, coupled with declining dependency ratios, creates favorable conditions for increased savings, investment, and productivity. However, this potential is not guaranteed.

The primary risk to realizing this dividend is the current state of underdeveloped human capital across the region. As highlighted by the World Bank's Human Capital Index and key sectoral indicators, today's children and youth will only reach 50-60% of their potential productivity without significant improvements in health, nutrition, education, and protection. The period between now and 2040 is particularly critical, as historically low dependency ratios offer the most opportune moment for transformative investment.

This analysis makes a compelling case that a portfolio of high-impact, cost-effective interventions is required to build the necessary human capital. Foundational investments—such as strengthening the social service workforce, establishing universal child and family benefits, ensuring quality education from early childhood through secondary school, and closing gaps in essential health and nutrition services—are not merely social expenditures but essential economic strategies.

The economic returns on human capital investments are potentially substantial. Our modelling indicates that by prioritizing human capital, Central Asian nations can unlock a powerful "second dividend," boosting GDP per capita by an additional **6% to 14% by 2050** above baseline projections. Two-thirds of this growth is directly linked to a healthier, better-educated, and more productive workforce. The message is clear: the window of opportunity is narrowing as populations begin to age. Decisive, strategic action is needed now to convert the region's demographic potential into lasting prosperity.

While the investment portfolio detailed in this report primarily requires national action, the potential of the demographic dividend can be significantly amplified through enhanced regional collaboration. The five Central Asian nations share not only common borders but also demographic trajectories, labour markets, and environmental challenges. By working together, countries can create economies of scale, share policy innovations, and develop harmonized standards for skills and education. There are also opportunities to jointly address cross-border issues, from managing labour migration and water resources to building regional climate resilience. A collaborative approach will ensure that the individual efforts of each nation contribute to a more prosperous and integrated region, maximizing the returns on human capital investment outlined in this report.

8. Annex 1: Methodology

This annex outlines the methodology used to produce the key components of the report. The analysis combines demographic projections, economic modeling, and a sectoral review of key human capital indicators to quantify future challenges and identify strategic investment priorities.

8.1. Demographic Analysis and Projections

The foundation of this report is a comprehensive demographic analysis based on the most recent and authoritative data available.

The core demographic data, including historical estimates and future projections of population size, age and sex structure, fertility rates, mortality rates, and migration, were sourced from the United Nations, Department of Economic and Social Affairs, Population Division, *World Population Prospects: The 2024 Revision (*UN WPP). The "medium fertility variant" was used for all primary projections to 2050 and beyond.

Key Indicators Analyzed included:

- Analysis of total population growth, median age, and population density for the five Central Asian countries (Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan, and Uzbekistan).
- Projections for key age cohorts, including children (0-17), adolescents (10-19), youth (15-24), the working-age population (15-64), and the elderly (65+).
- Calculation of child, old-age, and total dependency ratios to assess the changing economic burden on the working-age population.
- Analysis of historical and projected Total Fertility Rates (TFR) to understand the pace of demographic transition.

The classification of countries into "pre-dividend," "early-dividend," "late-dividend," and "post-dividend" stages was adapted from the methodology developed by the World Bank Group in their *Global Monitoring Report 2015/2016*. This typology is based on a country's total fertility rate and the growth trajectory of its working-age population share.

8.2. Economic Modeling of the Demographic Dividend

To estimate the potential economic benefits of human capital investment, the report employed an economic model adapted from established academic research. The analysis of the "second demographic dividend" is based on the economic model and findings presented in 'Demographic Dividends, Human Capital, and Saving' by Mason, Lee, and Xue Jiang (2016). This model quantifies how declining fertility rates can lead to increased growth in per capita consumption, driven primarily by the deepening of human capital.

The size of the demographic dividend depends on the speed of decline in the fertility rate, which differs across Central Asian countries. Over three decades, if the fertility rate falls from 3 to replacement fertility – a scenario of 'fast' fertility decline – then the second dividend can lead to an increase in the compound annual growth rate (CAGR) of per capita consumption by 0.75 percentage points. If the fertility rate falls more gradually and does not reach replacement fertility over the three decades – a scenario of 'medium' fertility decline – then the increase in the CAGR of per capita consumption can be 0.5 percentage points. Under either scenario, human capital deepening accounts for two-thirds of the increase in per capita consumption, with physical capital deepening accounting for the remaining third. Based on projected fertility rates for Central Asian countries in 2050, the scenario of 'fast' fertility decline applies to the Kyrgyz Republic and Turkmenistan, whilst the scenario of 'medium' fertility decline applies to Kazakhstan, Tajikistan and Uzbekistan.

To estimate the *additional* impact of the second dividend on growth, it is necessary to project a baseline change in economic growth between 2025 and 2050. We apply the "convergence theory" to project the business-as-usual growth in gross domestic product (GDP) across the Central Asian countries. The convergence theory posits that economies tend to move toward a long-run steady-state growth path i.e., developing (poorer) countries under similar structural and institutional conditions grow faster than developed (wealthier) countries because of diminishing marginal returns to capital in the latter and the opportunity for the former to adopt frontier technologies at lower costs.[283] Over time, this dynamic leads to a process of "catch-up" or convergence, where growth rates decline gradually and stabilize around a long-run steady-state determined by factors such as technological progress, demographic trends, and structural efficiencies.[284] Each country's GDP growth rate is projected to gradually decline and converge to the global average GDP growth rate of the next income group (e.g., for a lower-middle income country its growth rate will coverage toward the growth rate of upper-middle income countries) with the speed of adjustment determining how quickly each country converges to the next income group growth rate, thereby producing a smooth and realistic transition overtime.

The second factor that determines the impact of the second dividend on the economy is the relative size of consumption as a share of the economy. In line with the convergence theory, we assume that the share of household consumption in each country's GDP will converge toward the global average for their income group as of 2050. Table 1 contains the baseline estimate of Households and Non-Profit Institutions Serving Households (NPISHs) final consumption expenditure as a share of GDP and the contemporary global averages for lower-middle-, upper-middle- and high-income countries. The global average for country income groups is relatively stable over time. We use the average the previous decade with available data (2014-2023) to estimate the contemporary global average for each income group. We select the relevant global average for each Central Asian country (in the second column of the below table) based on the income group to which the country will belong in 2050 according to our projections using convergence theory.

Table 10. Households and Non-Profit Institutions Serving Households (NPISHs) final consumption expenditure as a share of GDP (%) at baseline (2023) for Central Asia countries, and projected for 2050 based on the global average for lower-middle, upper-middle and high income countries between 2014-2023.

	Baseline (2023)	Projected (2050)
Kazakhstan	51	58 [HIC]
Kyrgyzstan	88	68 [LMIC]
Tajikistan	88	68 [LMIC]
Turkmenistan	15*	48 [UMIC]
Uzbekistan	68	48 [UMIC]

Source: *World Bank DataBank. *For Turkmenistan, the baseline estimate is from the latest available data (2012).*

Regarding the required investments in human capital to realise the second dividend, the Mason et al. model elaborates on the source of investments and the most relevant sectors. Focusing on health (including nutrition) and education (including youth training) as the primary sectors for human capital spending,[285] their cross-sectional analysis finds that the public sector is dominant in high

[283] Solow, R. M. (1956). A contribution to the theory of economic growth. The quarterly journal of economics, 70(1), 65-94.
[284] Mankiw, N. G., Romer, D., & Weil, D. N. (1992). A contribution to the empirics of economic growth. The Quarterly Journal of Economics, 107(2), 407–437.
[285] Our investment needs analysis extends the scope of human capital sectors to include water, sanitation and hygiene (WASH), social protection and child protection. Therefore, the projected returns associated with the second dividend in Central Asia may be underestimated vis-a-vis the scope of interventions modelled in our investment needs analysis.

income countries accounting for about 80 percent of human capital spending. Whereas the public sector in middle and low income countries accounts for about 60 percent of human capital spending. Critically, the human capital spending advantage of high income countries (measured in YoLYs – explained in the main report above) is entirely due to public spending.[286] Private spending is greater for both health and education in middle and low income countries than it is in high income countries. An important implication of this for the interpretation of our investment needs analysis is that the onus of human capital deepening as a country seeks high-income status[287] depends on public policy. The economic returns depend directly on the public sector directing greater resources into human capital investment. These results are relevant to considerations of inequality to the extent that public investment in human capital is broadly distributed across all socio-economic strata, whereas private spending has a steep socioeconomic gradient. This concern should guide private sector regulation in low- and middle-income countries in Central Asia where the government's capability to invest in human capital is limited and there is a greater reliance on private sector investment.

8.3. Sectoral Analysis and Intervention Prioritization

The report includes a detailed analysis of six key sectors essential for human capital development. For each sector, a consistent approach was used to assess the current situation, identify gaps, and propose cost-effective interventions.

For each sector, several methodological steps were included:

4. **Baseline Assessment:** Key performance indicators were selected for each sector based on international standards (e.g., Sustainable Development Goals), data availability, and the extent to which improving the indicators was a regional priority. Data was compiled from a range of sources, including UNICEF Data, World Bank EdStats, ILOSTAT, the WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP), and national statistical agencies. Establishing the extent to which improving the indicators was a regional priority was conducted via an analysis of each government's key policies and strategies.
5. **Target Setting:** Ambitious but achievable targets were set for 2035 and 2050. In many cases, this involved aiming for universal coverage (100%) or meeting established international benchmarks. It also took into consideration country priorities through the policy and strategy review conducted above. For indicators where no global standard exists (e.g., social service workforce density), the regional best performer was used as a benchmark to ensure contextually relevant and aspirational goals.
6. **Intervention Selection:** Cost-effective, high-impact interventions were identified based on a review of global evidence and their alignment with the specific challenges and national priorities within Central Asia. The selection process prioritised foundational investments with the potential for catalytic, cross-sectoral impact (e.g., strengthening the social service workforce, expanding universal child benefits).
7. **Needs Estimation:** For quantifiable interventions (e.g., number of social service workers needed), estimates were calculated by comparing the projected 2050 child population against the target ratio (e.g., 160 SSWs per 100,000 children).

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[286] The model finds that the increased reliance on public investment in human capital that occurs with development is related to income per se (or correlates of income). It is not because public spending responds more to fertility decline than does private spending; it does not.

[287] The Central Asian countries that can reasonably be perceived to be seeking high income status by 2050 (based on the size of their economy as of 2025) include Kazakhstan, Uzbekistan and Tajikistan.

9. Annex 2: Additional country-specific data and graphics

Table 11. Total population in absolute terms 2000-2050 by country

Countries	2000	2015	2025	2035	2050
Uzbekistan	24,787,055	30,749,347	37,053,428	43,175,102	52,210,755
Kazakhstan	15,501,103	18,084,169	20,843,755	23,125,952	26,544,265
Tajikistan	6,284,736	8,643,840	10,786,734	12,695,585	15,574,643
Kyrgyzstan	5,025,146	6,001,882	7,295,035	8,282,415	9,642,953
Turkmenistan	4,582,677	6,215,770	7,618,848	8,538,669	9,639,708
Total	56,180,717	69,695,008	83,597,800	95,817,723	113,612,324

Source: *United Nations, Department of Economic and Social Affairs, Population Division, World Population Prospects: The 2024 Revision (UN WPP), United Nations, New York, 2024.*

Table 12. Change in total population in absolute terms 2025-2050 by Central Asian Countries

Central Asian Countries	*2025*	*2050*	*Absolute Increase in Population 2025-2050*
Kazakhstan	*20843755*	*26544265*	*5,700,510*
Kyrgyzstan	*7295035*	*9642953*	*2,347,918*
Tajikistan	*10786734*	*15574643*	*4,787,909*
Turkmenistan	*7618848*	*9639708*	*2,020,860*
Uzbekistan	*37053428*	*52210755*	*15,157,327*
Total	*83597798*	*113612322*	*30,014,524*

Source: *United Nations, Department of Economic and Social Affairs, Population Division, World Population Prospects: The 2024 Revision (UN WPP), United Nations, New York, 2024.*

Figure 37. Composition of the total dependency ratio (child dependency ratio and old-age dependency ratio) for Uzbekistan, 2000-2050

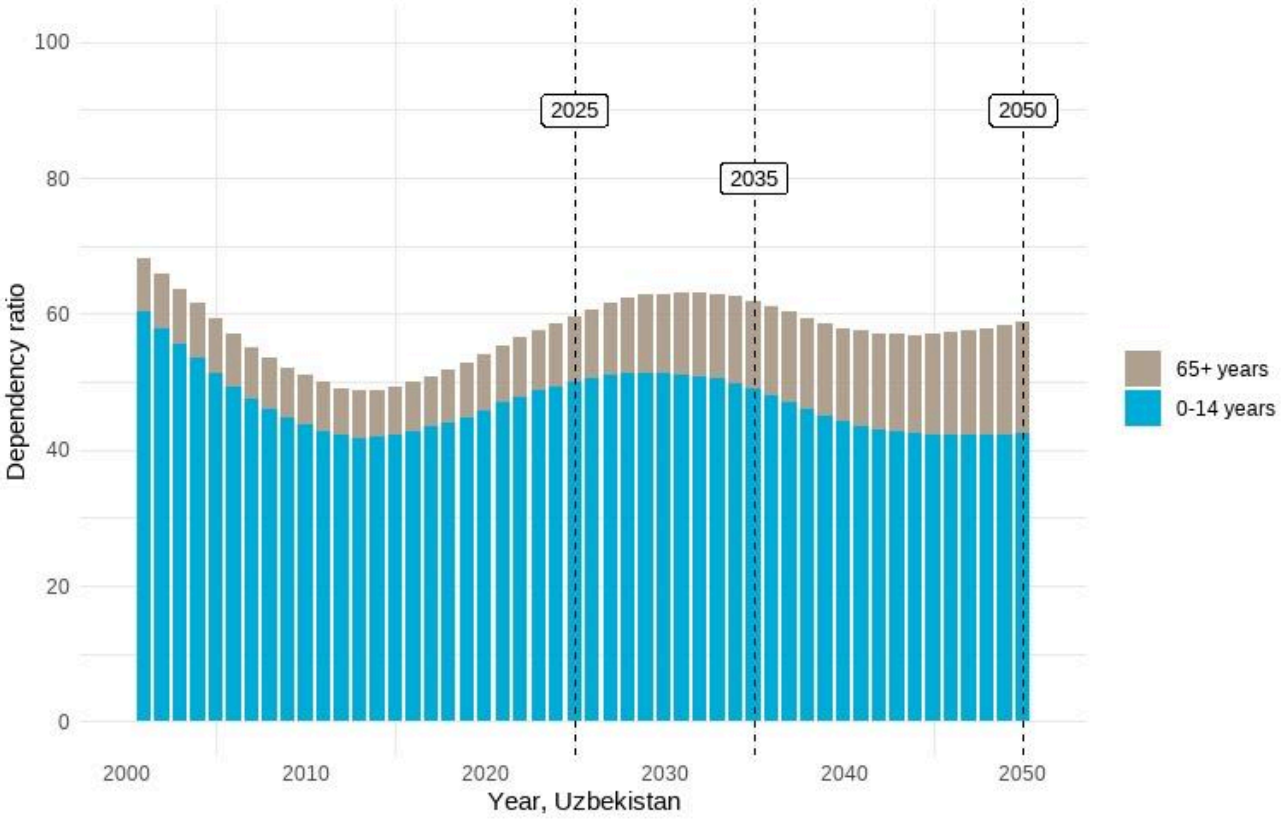


Figure 38. Composition of the total dependency ratio (child dependency ratio and old-age dependency ratio) for Turkmenistan, 2000-2050

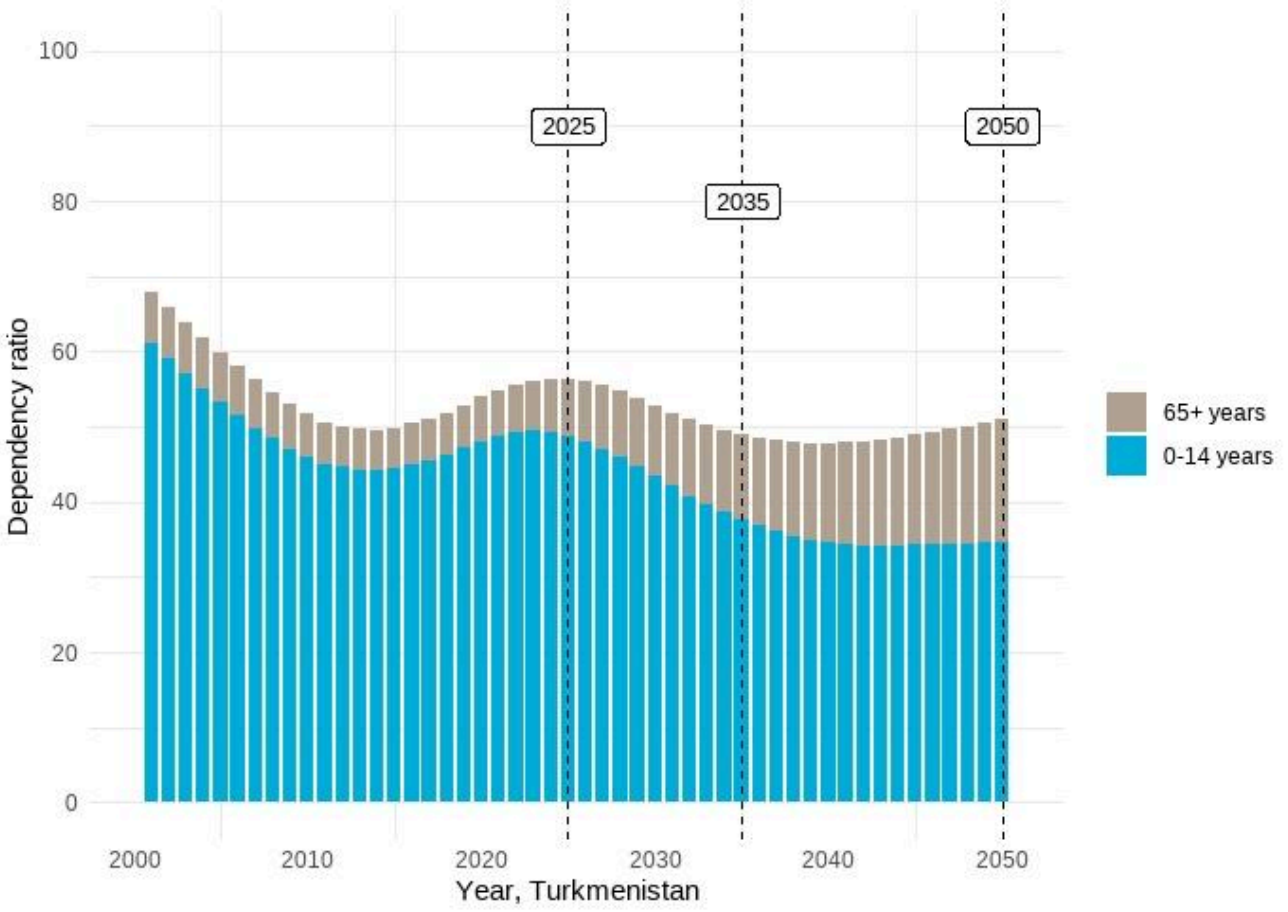


Figure 39. Composition of the total dependency ratio (child dependency ratio and old-age dependency ratio) for Kyrgyzstan, 2000-2050

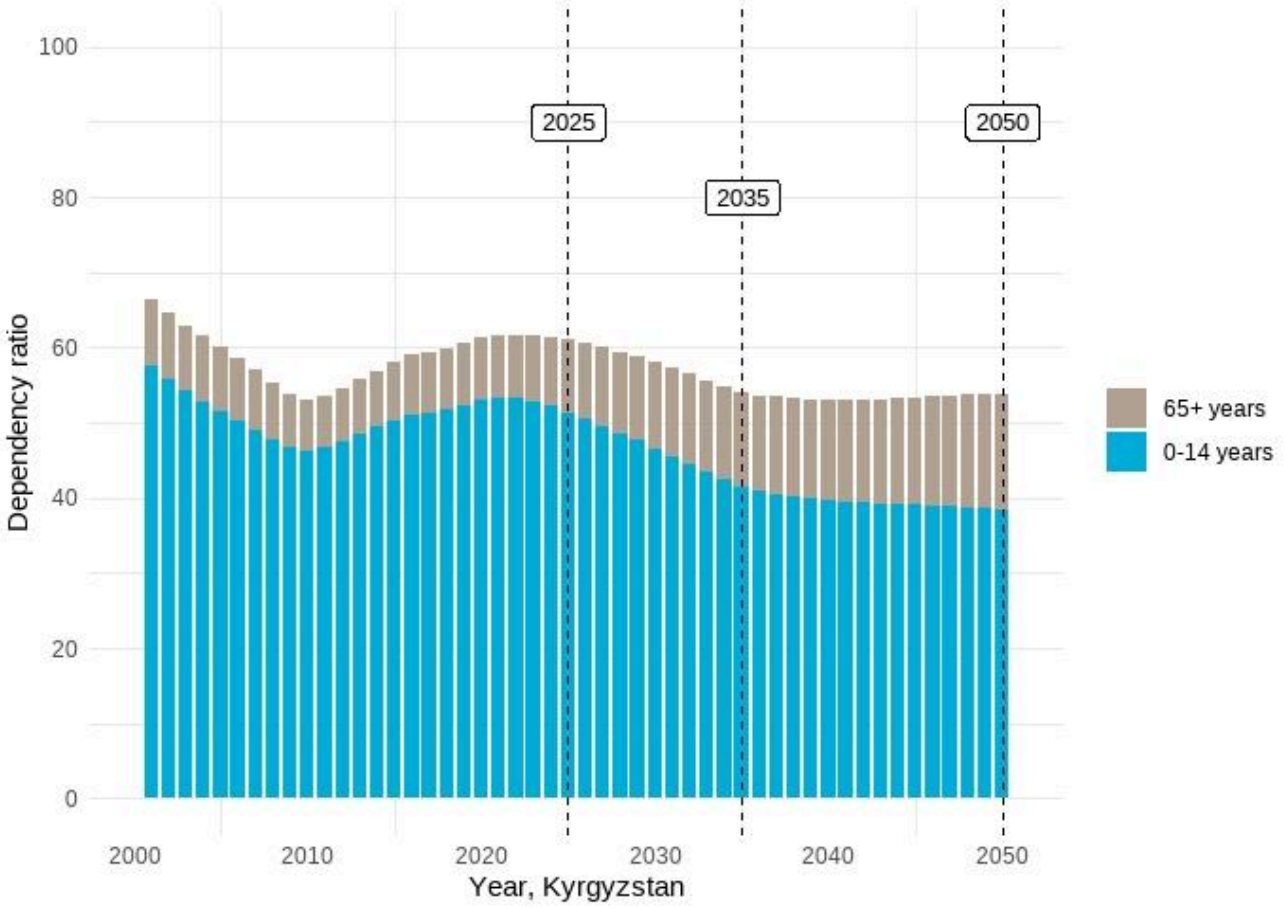


Figure 40. Composition of the total dependency ratio (child dependency ratio and old-age dependency ratio) for Tajikistan, 2000-2050

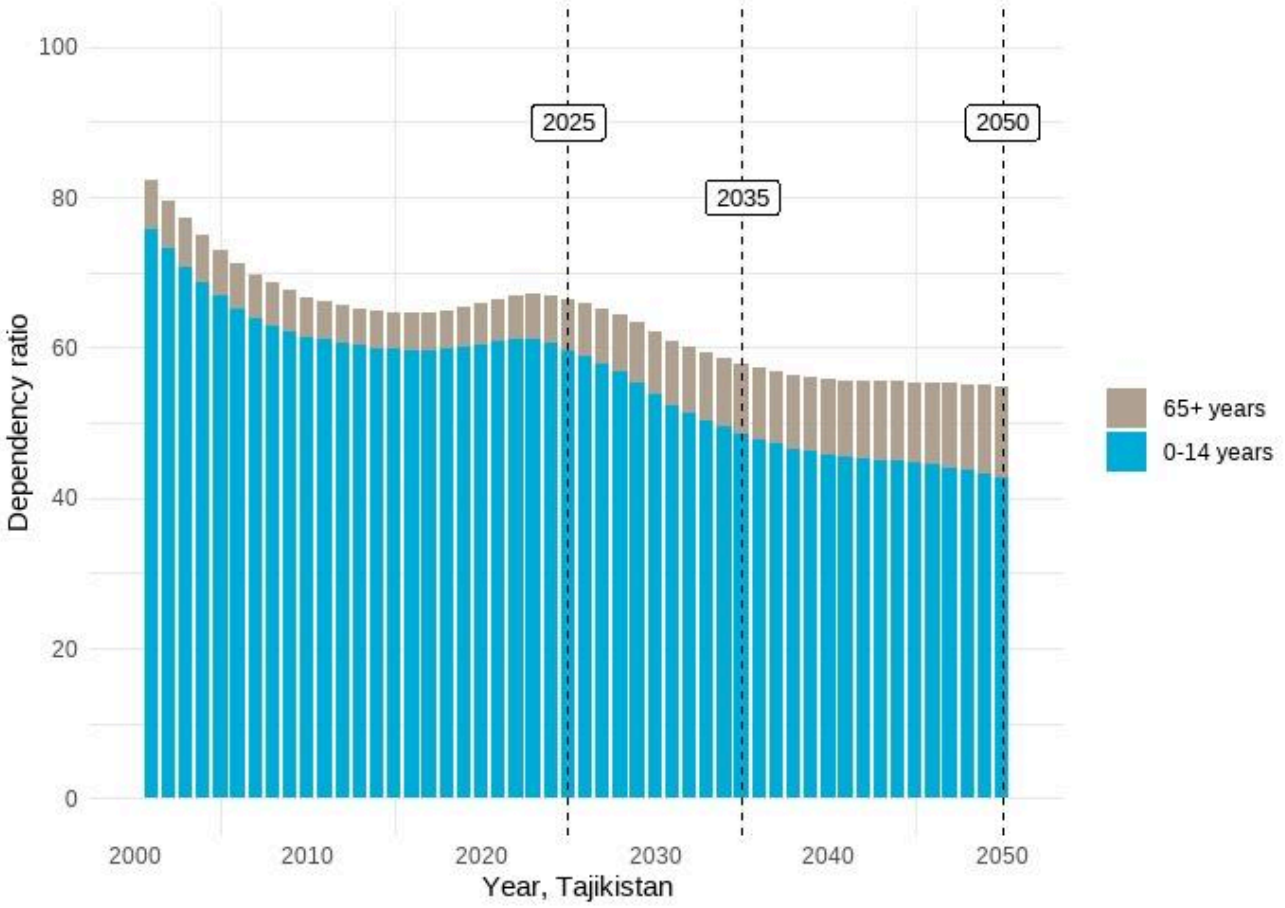


Figure 41. Composition of the total dependency ratio (child dependency ratio and old-age dependency ratio) for Kazakhstan, 2000-2050

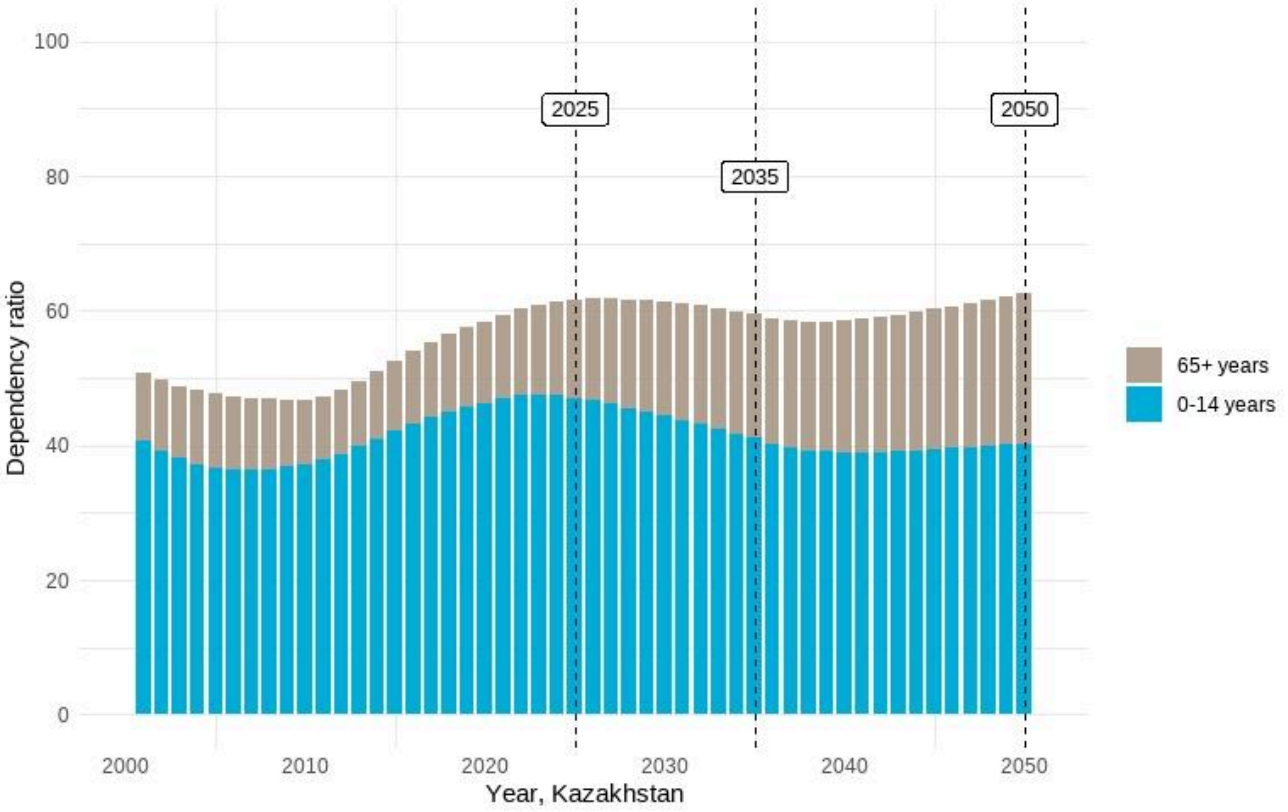
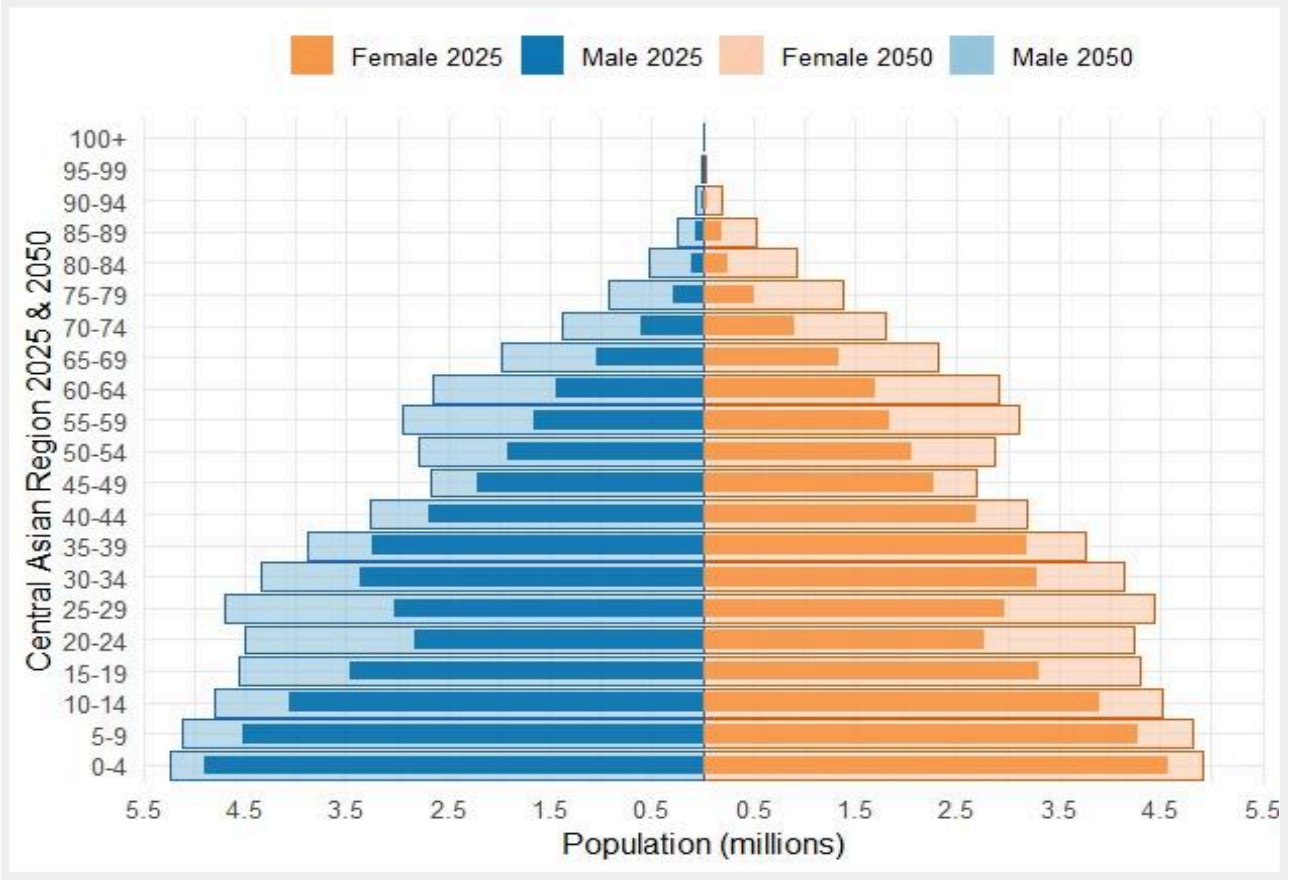
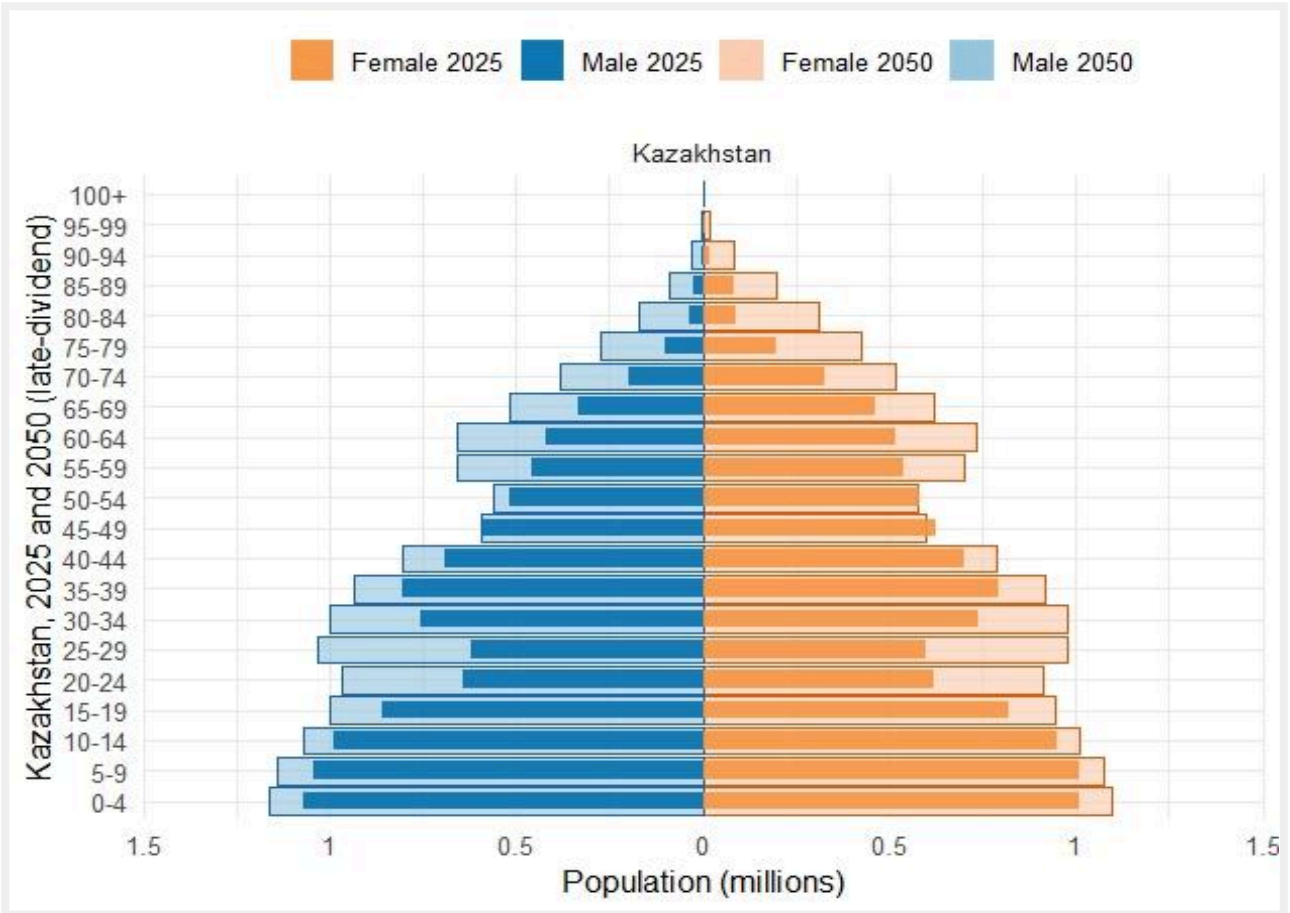
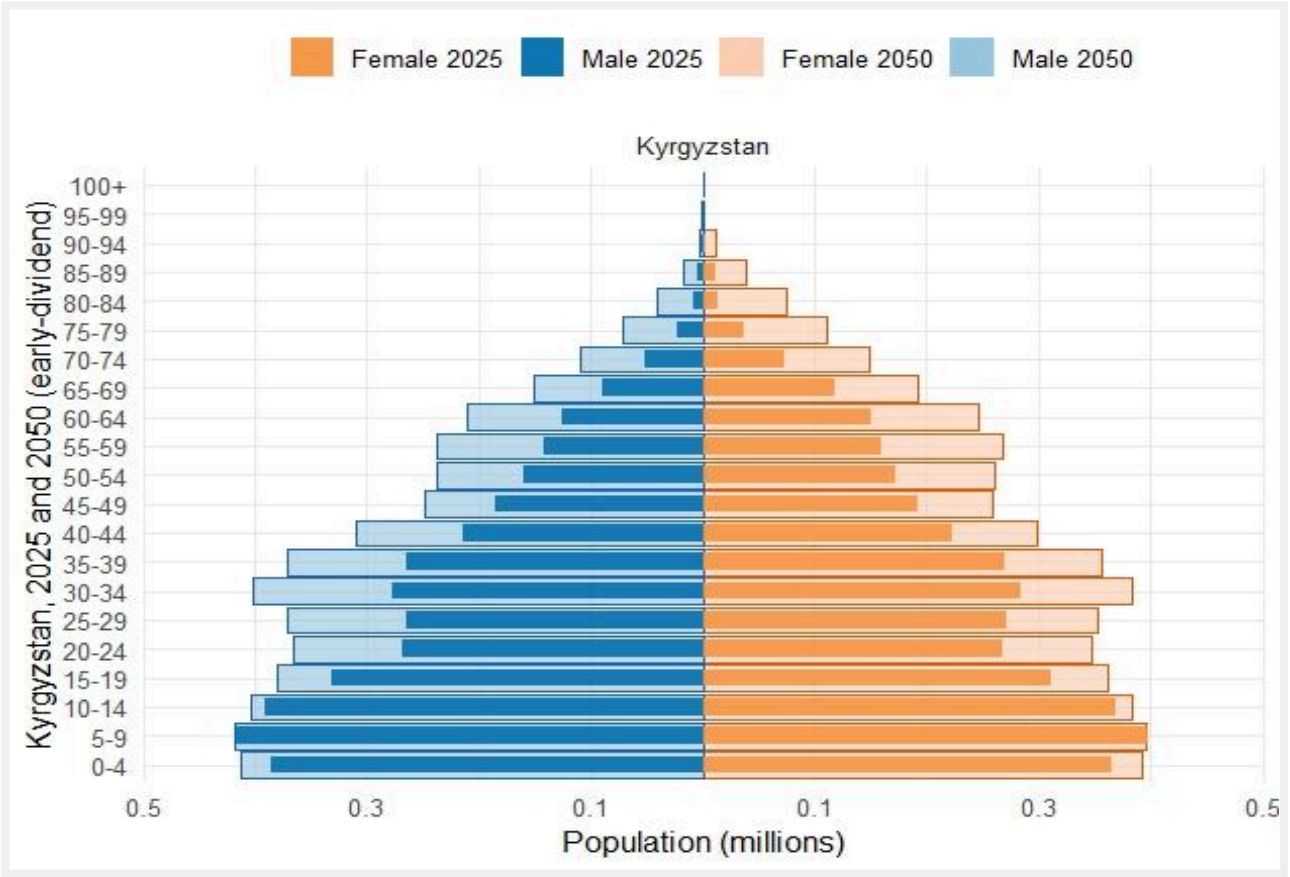
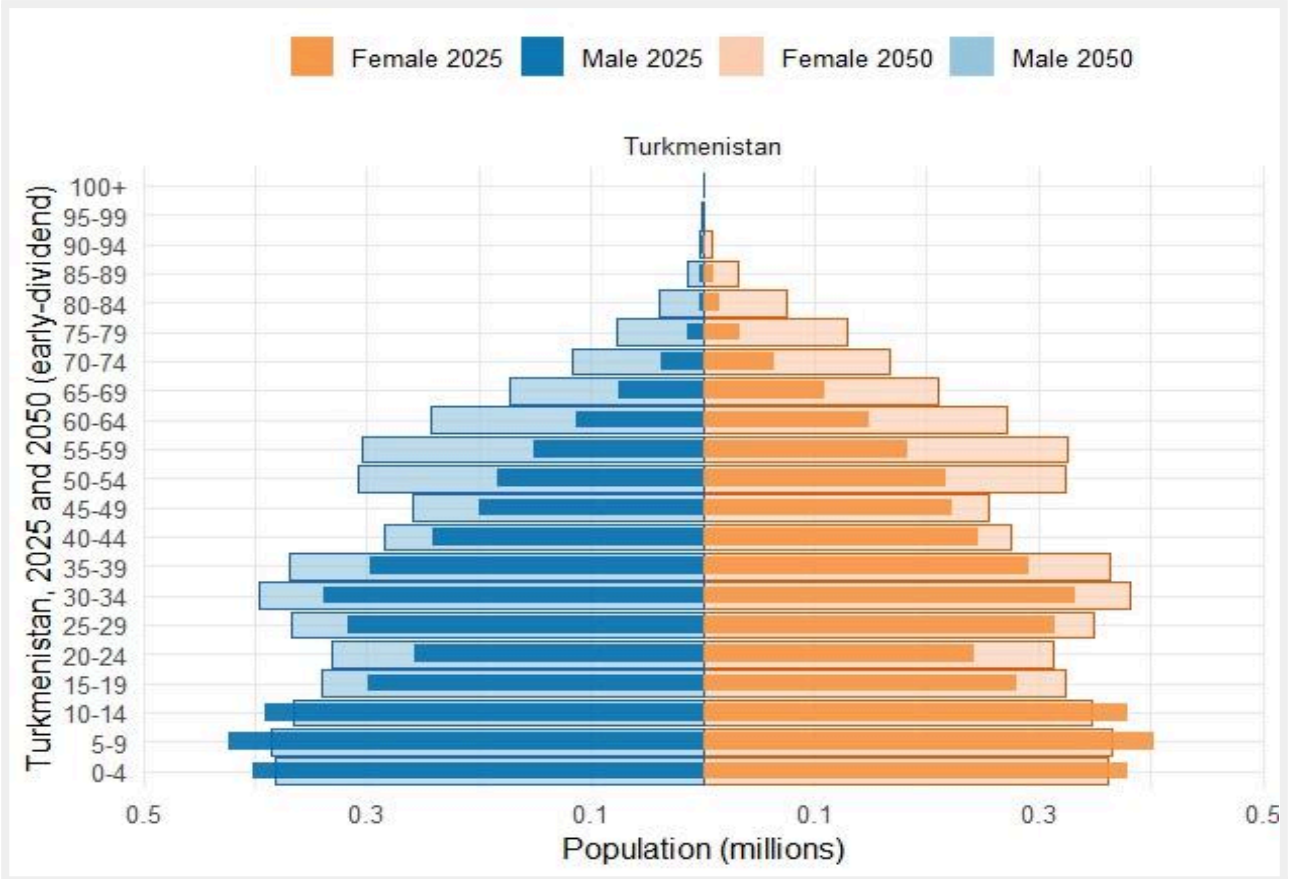


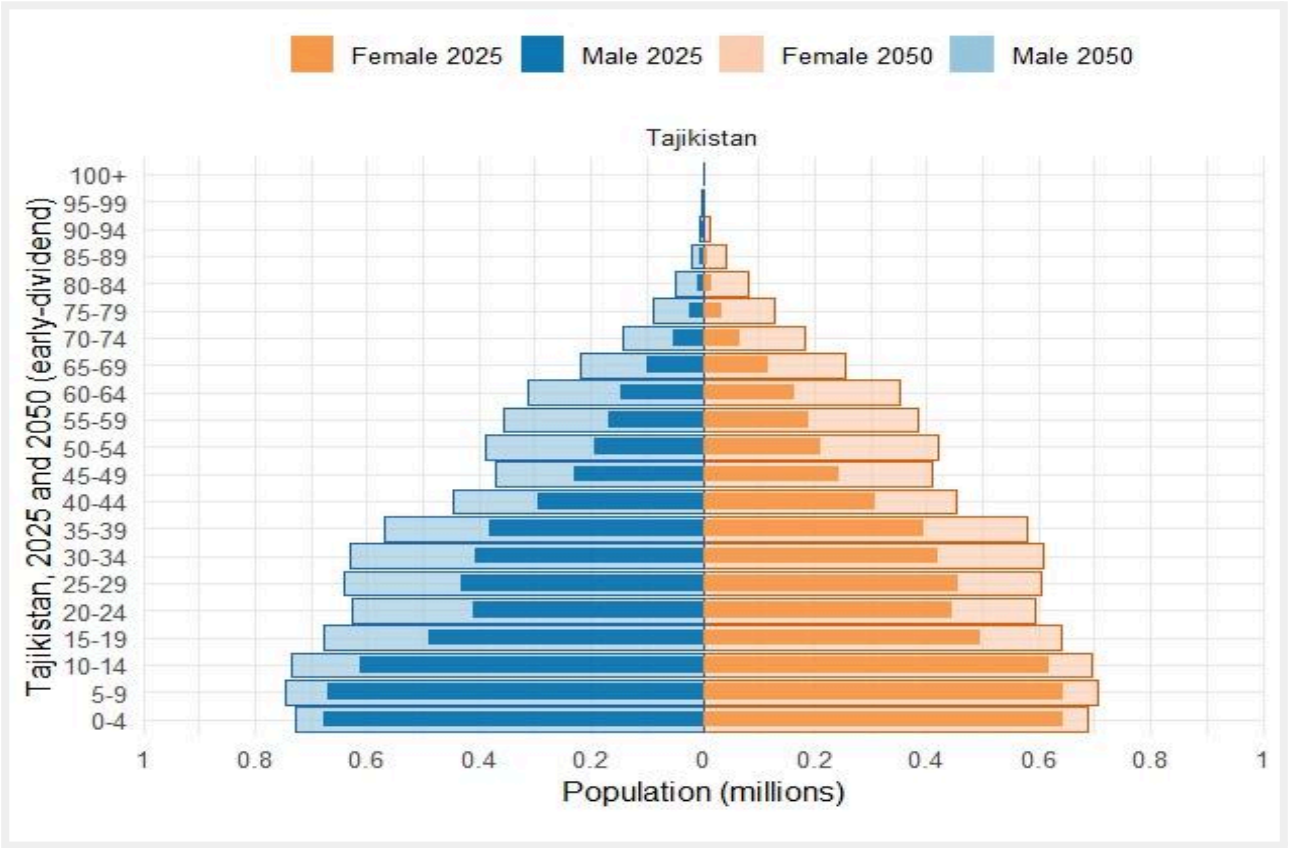
Figure 42 - 47. Population by age and sex of Central Asian countries, 2025 and 2050 (in millions)

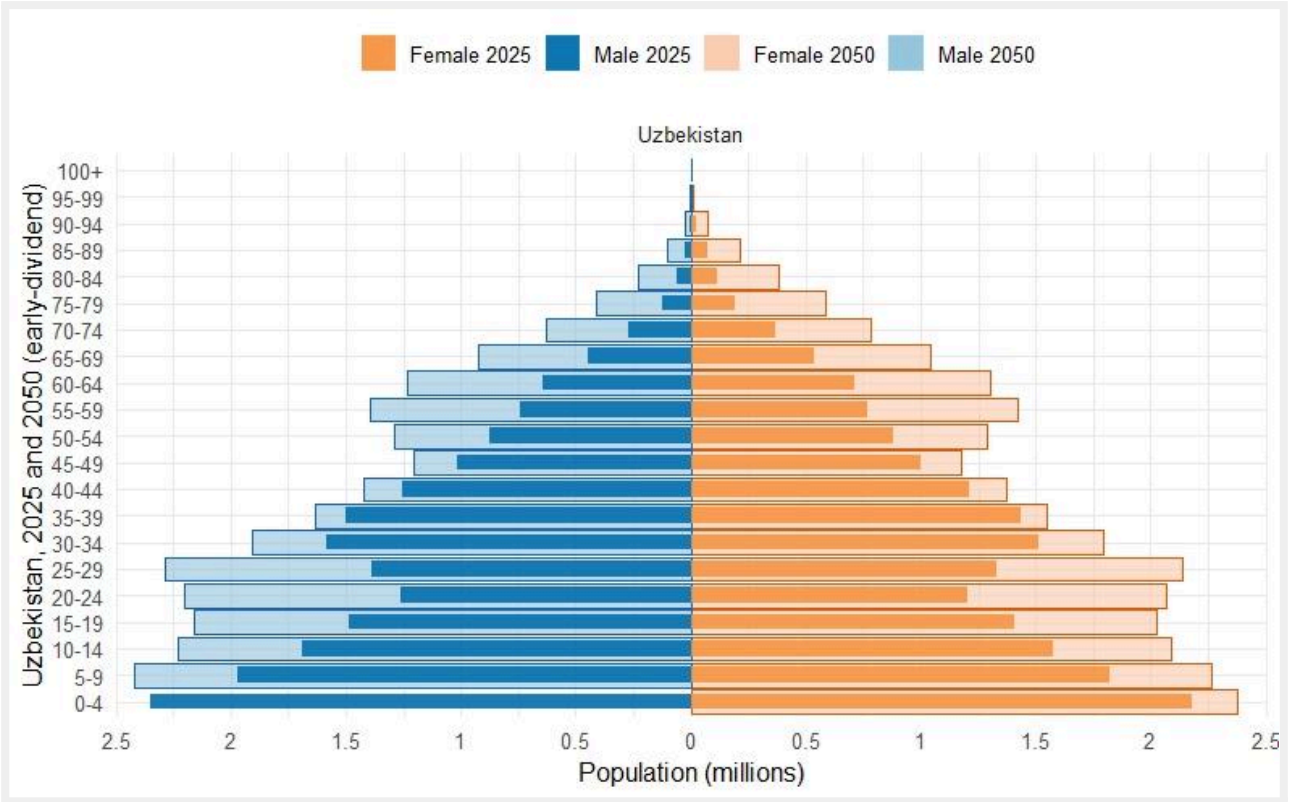





Female 2025
Male 2025
Female 2050
Male 2050
Kyrgyzstan
Kyrgyzstan, 2025 and 2050 (early-dividend)
100+
95-99
90-94
85-89
80-84
75-79
70-74
65-69
60-64
55-59
50-54
45-49
40-44
35-39
30-34
25-29
20-24
15-19
10-14
5-9
0-4
0.5
0.3
0.1
0.1
0.3
0.5
Population (millions)


Female 2025
Male 2025
Female 2050
Male 2050
Turkmenistan
Turkmenistan, 2025 and 2050 (early-dividend)
100+
95-99
90-94
85-89
80-84
75-79
70-74
65-69
60-64
55-59
50-54
45-49
40-44
35-39
30-34
25-29
20-24
15-19
10-14
5-9
0-4
0.5
0.3
0.1
0.1
0.3
0.5
Population (millions)


Female 2025
Male 2025
Female 2050
Male 2050
Tajikistan
Tajikistan, 2025 and 2050 (early-dividend)
100+
95-99
90-94
85-89
80-84
75-79
70-74
65-69
60-64
55-59
50-54
45-49
40-44
35-39
30-34
25-29
20-24
15-19
10-14
5-9
0-4
1
0.8
0.6
0.4
0.2
0
0.2
0.4
0.6
0.8
1
Population (millions)


Female 2025
Male 2025
Female 2050
Male 2050
Uzbekistan
Uzbekistan, 2025 and 2050 (early-dividend)
100+
95-99
90-94
85-89
80-84
75-79
70-74
65-69
60-64
55-59
50-54
45-49
40-44
35-39
30-34
25-29
20-24
15-19
10-14
5-9
0-4
2.5
2
1.5
1
0.5
0
0.5
1
1.5
2
2.5
Population (millions)

10. Annex 3: Health and Nutrition Sector Intervention Definitions

All health and nutrition interventions were derived from the Lives Saved Tool (LiST). The full definitions for each of these are included below.

- **ORS:** Oral rehydration salts. Percent of children with diarrhea in the last 2 weeks treated with ORS.
- **Clean birth environment:** Percent of births in a clean environment.
- **Immediate drying and additional stimulation:** Immediate drying and additional stimulation for all newborns.
- **Thermal protection:** Proportion of newborns with thermal protection (placed on mother's chest, dried and wrapped).
- **Clean cord care:** Percent of newborns with clean cord care (clean instrument to cut cord and nothing applied to stump or antiseptic applied).
- **Antenatal care (at least 4 visits):** Percent of women 15-49 years with a live birth in the last 12 months who received at least 4 antenatal care visits from a skilled provider.
- **BCG vaccine:** Percent of children 12-23 months who received BCG vaccine.
- **Polio vaccine:** Percent of children 12-23 months who received 3 doses of Polio vaccine.
- **DPT vaccine:** Percent of children 12-23 months who received 3 doses of DPT vaccine.
- **H. influenzae b vaccine:** Percent of children 12-23 months who received 3 doses of H. influenzae type b vaccine.
- **HepB vaccine:** Percent of children 12-23 months who received 3 doses of Hepatitis B vaccine.
- **Pneumococcal vaccine:** Percent of children 12-23 months who received 3 doses of pneumococcal conjugate vaccine.
- **Measles vaccine:** Percent of children 12-23 months who received 1 dose of measles vaccine.
- **Provision of appropriate fortified complementary food for food secure population:** Percent of infants 6-23 months who receive appropriate complementary food.
- **Promotion of breastfeeding:** Percent of infants 0-5 months exclusively breastfed.
- **Periconceptual folic acid:** Percent of women who consume folic acid periconceptually.
- **Iron fortification:** Percent of population consuming iron-fortified foods.
- **Vitamin A supplementation:** Percent of children 6-59 months who received two doses of Vitamin A.