APPENDIX 2: The estimates of gaps, costs, and the direct employment impact of investments in care sectors

***Education services***

Equations 1 to 4 were used to determine the coverage gaps and investment costs (including teachers' salaries and non-salary expenditures) for the sub-sectors of education services (i.e., early childhood, primary, secondary and high school education).

*(1)*

*(2) (3)*

*(4)*

The Organization for Economic Co-Operation and Development (2019a) reports that in 2018, the average gross yearly teacher salary in Türkiye was equal to ₺60,121.2. We chose the average annual salary of higher education graduates in Türkiye (in 2018, ₺83, 348) as the target salary for teachers. The target annual gross salary for aides in preschool education was projected to be ₺42,562.[[1]](#footnote-1)

To begin with, to meet International Labour Organization (ILO) standards, approximately 4.3 million more enrollments are needed in Turkey's preschool system out of the 7.8 million children in the relevant age group (Equation 1). This comprises 1.9 million children under the age of three and 2.4 million children aged three to five. Meeting the legally mandated minimum ratios would necessitate 349,591 teachers and 349,591 aides (totaling 699,182 instructors). The additional employment of teachers would cost around ₺29.1 billion (Equation 2) in salaries while hiring 349,591 aides would require ₺14.9 billion (Equation 2). In total, an expenditure of ₺44 billion is needed for teacher and aid salaries.

In 2019, the total cost of preschool education, including kindergartens and nurseries, was ₺19.9 billion (Turkish Statistical Institute 2019a).[[2]](#footnote-2) A total of 93,302 teachers were employed, receiving a salary of ₺5.6 billion. Consequently, non-salary expenses for ECCE amounted to ₺14.2 billion. With 1,575,165 students enrolled, the non-salary expenses per student were ₺9,025.6. Accordingly, to bridge the coverage gap (4.3 million pupils) in ECCE, an additional ₺38.8 billion is required to cover non-salary expenditures (Equation 3). The overall expenditures, including salary and non-salary expenses, reach ₺82.8 billion, equivalent to 1.92 percent of GDP (Equation 4).

Secondly, the preschool calculations were repeated for primary, lower secondary, and high school education for the 2018–2019 period and the results are presented below.

To achieve the ILO's 2018 goal of 100 percent coverage, the entire population of children aged 6 to 9 (5,066,591) should be included in the primary education system. In the 2018–2019 academic year, 4,657,210 children, or 91.92 percent of the relevant age group, were enrolled in primary school, leaving a need for 409,381 additional capacities (Equation 1). Following the target of 31 pupils per teacher set by the International Labour Organization (2018), hiring 13,206 additional teachers would bridge this coverage gap, requiring a gross yearly salary expenditure of ₺1.1 billion (Equation 2). Additionally, the required annual non-salary spending amounts to ₺1.9 billion (Equation 3). Therefore, an investment of ₺3 billion is necessary to enroll an additional 409,381 pupils in primary school, equivalent to 0.07 percent of GDP (Equation 4).

To fulfill the ILO's 100 percent coverage goal for lower secondary school education, the entire population of children aged 10 to 13, totaling 5,115,296 students, should be included. In the 2018–2019 academic year, 4,771,548 children, or 93.3 percent of the relevant age group, were enrolled, leaving a need for 343,748 additional capacities (Equation 1). Following the target of 28 students per teacher set by the International Labour Organization (2018), hiring 12,277 teachers would bridge this coverage gap, requiring a total gross yearly salary expenditure of ₺1 billion (Equation 2). Additionally, overall yearly non-salary spending amounts to ₺1.9 billion (Equation 3).[[3]](#footnote-3) Therefore, enrolling an additional 343,748 lower secondary school students would necessitate a total investment of ₺2.9 billion, equivalent to 0.07 percent of GDP (Equation 4).

To achieve the ILO's 2018 goal of 100 percent coverage in high school education, 4,961,220 students need to be enrolled within the age range of 14 to 17. In the 2018–2019 academic year, 4,961,220 pupils (84.2 percent) were enrolled in high schools, leaving a need for 783,873 additional capacities (Equation 1). To bridge this coverage gap, hiring 27,995 additional teachers is required to meet the ILO's target of 28 students per teacher. Therefore, the total gross yearly salary expenditures must amount to ₺2.3 billion (Equation 2). Overall non-salary spending for the year reaches ₺7.4 billion (Equation 3). [[4]](#footnote-4) Consequently, a total investment of ₺9.8 billion is necessary to meet the ILO target for high school education, representing 0.23 percent of GDP (Equation 4).

Thirdly, in ECCE, we assumed that five non-teaching staff members would be employed for every school with 100 student capacity, totaling 214,797 non-teaching personnel. Overall, we estimate that preschools need to hire a total of 913,979 teachers and other staff.

For primary, lower secondary and high school education, we considered employing eight non-teaching staff members for each school with an average student capacity, including managers, clerks, and workers for various services (Official Gazette 2013).

The number of primary schools needed was calculated by dividing the 409,381 students by the average school capacity of 218 pupils for the 2018–2019 academic year (Ministry of National Education 2019). This results in 1,878 primary schools with a total of 28,230 employees, including 13,206 new teaching positions and 15,024 support staff.

For lower secondary school education, 1,138 schools are required to accommodate 343,748 students, with an average of 302 students per school. This school investment will create 21,381 new jobs, including 12,277 teaching positions and 9,104 support positions.

To accommodate the additional 783,873 high school students, 1,898 schools with an average enrollment of 413 students are needed, resulting in 43,179 new jobs (27,995 teachers and 15,184 support staff).

As a result, the primary, lower secondary, and high school education services will generate 92,790 additional direct jobs. Overall, investment in education services for a total of 5,832,947 children, will generate 752,660 teaching positions and 254,109 non-teaching jobs, resulting in a total of 1,006,769 new jobs.

***Short-term healthcare services***

Although Türkiye met the ILO's minimum threshold of 4.45 doctors, midwives, and nurses per thousand people in 2019 (llkkaracan 2020:26; International Labour Organization 2018:266), the COVID-19 pandemic significantly increased the demand for healthcare services. Therefore, the coverage gap in STC was determined by using the Organization for Economic Co-Operation and Development (OECD) averages.

Equations 5 to 13 were used to determine the coverage gaps and investment costs for STC services.

*(5)*

*(6)*

*(7)*

*(8)*

*(9)*

*(10)*

*(11)*

*(12)*

*(13)*

Health workers were divided into two groups (International Labour Organization 2018; UN Women and International Labour Organization 2021): doctors, midwives, and nurses (DMN), and health workers in the other cadres (HWOC). In Türkiye in 2019, there were a total of 1,033,767 health professionals, including 160,810 doctors, 198,103 nurses, and 249,222 HWOC, serving a population of 83,154,997 (Ministry of Health 2019a; Turkish Statistical Institute 2019b).

A total of 148,395 nurses and midwives and 82,834 doctors are needed to meet the threshold values.[[5]](#footnote-6) These results in a total deficit of 231,229 in the DMN category (Equation 5). To close the HWOC gap, an additional 138,737 workers are required (Equation 6 and 7). The overall staff deficit in STC, including DMN and HWOC, amounts to 369,966 (Equation 8). Additionally, there is a projected shortage of 207,181 administrative and support staff (AS) (Equation 9 and 10).

The cost of hiring additional doctors, midwives, and nurses at the targeted wage[[6]](#footnote-7) is estimated at ₺27.3 billion in salary expenses (Equation 11). An additional ₺20.6 billion[[7]](#footnote-8) is needed for non-salary spending in DMN employment. (Equation 12). To address the coverage gap of 231,229 healthcare professionals, the total expenditure required, including salaries and non-salary expenses, is ₺47.9 billion, equivalent to 1.11 percent of GDP (Equation 13).

Considering the limited data availability, the direct employment impact in the STC sector was primarily analyzed for health professionals.[[8]](#footnote-9) [[9]](#footnote-10) This assessment indicates a total of 369,966 new jobs to be generated, comprising 231,229 positions for doctors, nurses, and midwives, and 138,737 jobs for other healthcare workers. [[10]](#footnote-11) Furthermore, there will be 207,181 new jobs for administrative and support staff. In total, STC is expected to employ 577,147 additional employees.

***Long-term health care services***

The coverage gap in LTC services is calculated only for elderly care, excluding the disabled, due to data constraints. Therefore, the LTC coverage gap and cost calculations represent a minimum estimate. The calculations are based on Equations 14 to 16.

*(14)*

*) (15)*

*(16)*

The coverage gap for LTC services can be determined using either the number of LTC employees or the number of individuals aged 65+ receiving services (UN Women and International Labour Organization 2021). In our study, we chose to consider international targets for both factors to determine the service gap. This approach was preferred because relying solely on the number of employees does not provide a definitive ratio for the 65+ age group that is targeted for LTC services. By using this dual calculation method, we were able to determine both the expected elderly population benefiting from LTC services and the direct employment impact of the required investments to close the coverage gap.

In 2019, Türkiye had a population of 7,550,727 individuals aged 65+. According to International Labour Organization (2018), the target coverage for LTC services in this age group was set at 12.4 percent. However, only 27,286 elderlies actually received LTC services. This indicates a coverage gap of 909,004 individuals in terms of service recipients in Türkiye (Equation 14).

We calculated the coverage gap also in terms of the LTC worker number. According to International Labour Organization (2018), the recommended ratio of LTC personnel to elderly individuals is 4.2 employees per 100 people. However, this ratio can vary widely among countries, ranging from 0 to 17 employees per 100 people (UN Women and International Labour Organization 2021). In Türkiye, the requirement is for nursing homes to have 8.67 nurses and caregivers per 100 elderly residents, which aligns with the global standard. Considering that 8,631 formal LTC workers were employed in Türkiye, to achieve the universal coverage rate of 12.4 percent for the population aged 65+ (i.e., for 936,290 elderlies to be covered in total in total, including 27,286 nursing home residents), an additional 72,545 full-time equivalent (FTE) LTC personnel are needed.

UN Women and International Labour Organization (2021) highlighted that even in high-income countries such as the U.S. and the UK, LTC employees receive relatively low salaries and suggested raising their wages.[[11]](#footnote-12) This study adopted a target salary of ₺70,411 for additional LTC workers. Therefore, 72,545 additional full-time LTC employees would require a total compensation of ₺5.1 billion to address the LTC coverage gap, representing 0.12 percent of GDP (Table 5) (Equation 15).

Türkiye had an average nursing home capacity of 65, accommodating 27,286 elderly individuals across 420 public and private facilities as of November 2019. To achieve the 12.4 percent universal coverage rate, 909,004 individuals would need to be covered. However, this study proposes a future approach that does not solely rely on residential (nursing home) services, aligning with International Labour Organization (2018). Given the scarcity of residential services, it is crucial to expand the range of available options for care and increase the number of services offered to individuals aged 65+ to close the coverage gap.

In this context, the required number of AS workers for 909,004 elderly individuals to access LTC services was initially estimated based on the existing rates for residential services. However, considering that the new LTC services will predominantly involve daycare and home professional services, the number of AS workers has been halved. A projected total of 13,985 nursing homes, each with a capacity of 65 persons, is anticipated. To comply with regulations, these facilities would require 8.67 nurses and caregivers per 100 elderly residents; thus, a total of 72,545 additional LTC employees (nurses and caregivers) are needed. Besides, regulations stipulate that each nursing home can employ up to 7 personnel for technical, administrative, and other services in addition to a responsible manager, social worker, psychologist, physiotherapist and dietician, resulting in 240,365 new direct jobs in the LTC industry (72,545 nurses and caregivers and 167,820 other AS employees). However, considering that the services will mainly be daytime and at home, the number of AS personnel is halved to 83,910, resulting in a total projected LTC employment of 156,455.

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1. In the 2019-20 school year, assistant teacher salaries approximated the minimum wage. The minimum annual and monthly gross wages in 2019 were ₺30,701 and ₺2,558.4, respectively, accounting for 51.1 percent of a kindergarten teacher's salary. We projected that the gross annual salary for assistant teachers would reach ₺42,562, considering the targeted increase in teacher pay. [↑](#footnote-ref-1)
2. In 2019, the total expenditure for public and private primary school education, including kindergarten education for 5-year-olds, amounted to ₺47 billion. Assuming that kindergarten education’s costs make up 8.45 percent of primary school expenditures (see Ilkkaracan et al. 2015), the cost alone is estimated to be ₺4 billion. The overall expenditure for public and private preschool education in 2019 was ₺15.9 billion. ₺4 billion was added to ₺15.9 billion to find the total cost of preschool education (₺19.9 billion). [↑](#footnote-ref-2)
3. The total annual average salary expenditure for the existing 354,198 teachers was ₺21.3 billion. After deducting this from the total lower secondary school expenditures of ₺51.8 billion, the annual non-salary expenditures amounted to ₺30.5 billion. With 5,627,075 enrolled students, the non-salary expenditure per student was ₺5,415. Multiplying this figure by the number of additional students (343,748) required to fill the coverage gap resulted in a total non-salary expenditure of ₺1.9 billion. [↑](#footnote-ref-3)
4. The average annual salary expenditure for the existing 371,234 teachers was ₺22.3 billion. After deducting this from the total high school expenditures of ₺72.3 billion, the annual non-salary expenditures amounted to ₺50 billion. With 5,267,378 registered students, the current non-salary expenditure per registered student was ₺4,740. This figure was multiplied by the number of students (4,657,210) to find total non-salary expenditures (₺22 billion). We divided the total non-salary expenditures (22 billion) by the number of students (4,657,210) and the current non-salary expenditures per student were found (₺9,492). Multiplying this figure by the number of additional students (783,873) required to fill the coverage gap resulted in a total non-salary expenditure of ₺7.4 billion. [↑](#footnote-ref-4)
5. According to the OECD 2020 data, there were 2.93 doctors and 9.8 nurses per 1,000 persons on average (The ratio of nurses to doctors exceeded 3) (Organization for Economic Co-Operation and Development 2020). In 2017, the OECD had 9.4 midwives and nurses per 1,000 people (Ministry of Health 2019a). For setting targets in Türkiye, it was considered reasonable to use the OECD average for the targeted number of physicians; however, the average OECD ratio was not used for midwives and nurses. This is because the ratio of midwives and nurses to doctors in Türkiye was lower than the OECD average (1.47 in 2017, 1.61 in 2018, and 1.58 in 2019). The Ministry of Health's 2019–2023 Strategic Plan (Ministry of Health 2019b) indicated a need for approximately 426,000 physicians and 258,000 nurses and midwives by 2023, with a predicted ratio of 1.65 nurses and midwives per doctor. Considering the COVID-19 pandemic, we used the threshold values of 4.84 nurses and midwives and 2.93 doctors per 1,000 people. [↑](#footnote-ref-6)
6. In parallel with UN Women and International Labour Organization (2021), 2019 salaries were used as target salaries for physicians, midwives and nurses. That is because, in 2019, the average annual gross salaries for physicians (an average of ₺173,233.7) and midwives and nurses (₺86,844) were higher than the average annual gross salary of higher education graduates (₺83,348). [↑](#footnote-ref-7)
7. Due to the lack of available data on the entire health industry, our cost calculations focused exclusively on the number of employees within the Ministry of Health. The affiliated institutes of the Ministry employed 281,544 doctors, midwives, and nurses. In 2018, the Ministry of Health allocated a total expenditure of ₺51.5 billion, with ₺26.4 billion dedicated to salary payments for all health workers (Ministry of Health 2019a). Accordingly, the Ministry’s central budget allocated ₺25.1 billion in 2019 for non-salary expenses on health workers. [↑](#footnote-ref-8)
8. We focused solely on calculating the direct employment effect of health workers for two main reasons. Firstly, the inclusion of non-bed health institutions and facilities with beds of varying sizes and locations makes it difficult to estimate the average capacity of these institutions and determine the number of staff other than health workers. Secondly, the significant variation in bed and patient capacities among healthcare facilities with beds further complicates the estimation process. [↑](#footnote-ref-9)
9. Hospital managers, assistant managers, health statisticians, warehouse clerks, and patient admission clerks are just a few examples of the employees that can be employed (Official Gazette 1983). [↑](#footnote-ref-10)
10. [↑](#footnote-ref-11)
11. In 2020, nurses in Türkiye received a net pay of ₺5,250, and care workers in nursing homes made an average of ₺3,200. Before the gross salary figures were calculated, the 2020 salary data was adjusted to 2019 in accordance with 4 percent and 5.75 percent wage increase rates for the first and second half of the year, respectively (Milliyet Daily 2020). Accordingly, in 2019, the gross monthly salary of a care worker working in LTC institutions was ₺4,300, while the monthly gross salary of a nurse was ₺6,800. The number of care staff employed in Türkiye for the same year was 7,947 and the number of nurses was 684 (Organization for Economic Co-Operation and Development 2019b). In this case, the average gross monthly salary of the LTC employee was $4,498. On an annual basis, it corresponded to ₺53,978.

    We calculated the difference between the average annual gross salary of the current LTC employee (₺53,978) and the average annual gross salary of a nurse working in STC services (₺86,844) to determine the targeted annual gross salary for the LTC employee in accordance with the salary improvement proposed by UN Women and International Labour Organization (2021). The estimated difference (₺32,867) was then divided by two. The targeted annual wage for LTC staff (₺70,410,8) was determined by deducting half of this difference from the yearly gross nursing salary (₺86,844). By doing this, we hoped to narrow the wage difference between an LTC employee and a nurse employed in the public STC sector and to raise LTC employees' pay accordingly. Even such a small increase in the LTC employee's wages is considered significant (Ilkkaracan and Kim 2019; UN Women and International Labour Organization 2021). [↑](#footnote-ref-12)