International Labour Organization

UN WOMEN

Policy Tool

UN Women – ILO Joint Programme Promoting Decent Employment for Women through Inclusive Growth Policies and Investments in Care

March 2021

A Guide to Public Investments in the Care Economy

Policy Support Tool for Estimating Care Deficits, Investment Costs and Economic Returns[1]

Key points

This policy support tool is prepared in the framework of the UN Women and ILO Joint Programme titled "Promoting Decent Employment for Women through Inclusive Growth Policies and Investments in the Care Economy" and as part of the UN-wide response initiatives to be included in the UN Socio-Economic Response to the COVID-19 pandemic. Within this framework, the tool aims to provide a methodology for **how to**:

- identify the coverage gaps in care services (namely public healthcare, long-term care, early childhood care & education, and primary and secondary education);
- estimate the costs of public investments and expenditures for eliminating these coverage gaps; and
- assess the various economic returns to such investments in the short- and the long-run.

I. Introduction

While the need for increased public investment in the care economy has long been an issue in policy debates, the Covid-19 pandemic has laid bare the urgency of this claim in multiple ways. Most importantly, in many countries around the world, the public (and overall) health systems have demonstrated limited capacity to cope with the sudden increase in demand for healthcare services. The health workers have been exposed not only to increased risks, but also extreme work hours and conditions, further aggravating the fragility of the system vis-à-vis the pandemic.

Given school closures and disruption of services under the lock down measures (closures of restaurants, limitations in access to domestic and care services), there has been an unprecedented increase in demand for household production and unpaid care work. A pandemic time-use survey in Turkey has found that the unpaid work time has increased by more than 11 hours per week on average for women, and almost 6 hours for men. Close to two thirds of women and more than one quarter of men who continue in employment under the pandemic conditions state that they find the total (paid and

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unpaid) workload extremely difficult to cope with (UNDP Turkey 2020; Ilkkaracan and Memis 2020). Similar increases in unpaid work time of both women and men under the lock down measures have been reported in other countries (Deshpande 2020 for India, UN Women 2020 for Jordan, Farres, et.al. 2020 for Spain, Andrew et.al. 2020 for the UK), all pointing out that the time squeeze on employed women is particularly severe forcing many to drop out of the labour market under pressures of the dual shift. Following from such evidence, UN Women (2020) and ILO (2020) note that the Covid-19 crisis exposed the unequal impact of the crisis on women and men, this time not only in terms of women's more fragile position in labour markets, but also in terms of the unequal gender distribution of care work.

Moreover in view of the severity of the economic impact of the pandemic around the world and rising rates of unemployment, there is a consensus in policy circles on the need for unprecedented economic policy stimulus. Fiscal stimulus packages need to be designed and implemented with attention to maximizing their efficiency so that they instigate the highest possible decent jobs and income generation, poverty prevention/reduction, inclusive and sustainable growth with particular attention to promoting gender equality. Ensuring that fiscal stimulus spending includes investments in the care economy, promises to meet these multiple policy objectives - jobs generation, poverty reduction and gender equality - simultaneously.

It has been long acknowledged that fiscal policy can serve as an effective tool to alleviate inequalities while at the same time boosting aggregate demand and growth through job creation. An emerging debate on macroeconomic policy points out that the specific choices made in stimulus packages with respect to the sectoral allocation of spending embody strong implications for the magnitude and composition of emerging labour demand. This is due to differential employment multipliers across sectors and also the varying composition of employment by gender and skills. Care service sectors are substantially more labour intensive than, for example, construction (a common target of stimulus spending) or most other service sectors. Also, the composition of labour demand tends to favour women more than men in care services while the reverse is true for other sectors such as construction. Care service expansion also triggers labour supply side effects in particular for women, by alleviating the constraints on their time and creating a more equal basis upon which they are able to make decisions to enter the labour market.

As such fiscal stimulus packages and targeted industrial policies supporting the expansion of health, education, and other neglected care service sectors can serve as an effective strategy to strengthen aggregate demand while improving longer-term economic growth, gender equality and societal wellbeing simultaneously (ILO 2018; Stiglitz 2016; UNCTAD 2017; UN Women 2018).

This policy support tool is meant to contribute to the design of post-pandemic intervention packages in order to promote an effective and inclusive recovery. Its purpose is to help governments prioritize expenditures from the perspective of a gender-equitable, and inclusive growth process. Further, it enables policymakers to be aware of the potential of investments in the care economy to meet multiple development priorities. It is meant to build on and support national capacities.

This "how to" guide to public investments in the care economy is based on recent country-level as well as cross country applied work by the ILO, UN Women, and some research institutes around the world since the 2010's (listed and summarized in the appendix). While these studies share a common research framework, they vary in terms of their analytical methodologies, the care sectors on which they focus, and the measures used for assessing economic returns. This tool builds on the diversity embedded in these studies so as to provide the user with various options in determining the exact scope of analytical dimensions, approaches and applications.

The policy support tool is structured as follows: Section II presents a description of the overall framework and provides an overview of the hitherto applied studies, which serve as a resource for this policy support tool. Section III introduces a general guideline for assessment and costing of care coverage gaps, Sections IV and V elaborate further in the context of the various sub-sectors of care services in the education and health & LTC sectors respectively. Finally, Section VI focuses on the assessment of economic returns by different methodological approaches.

II. Framework and Sample Studies

II.A. Defining 'Investing in the Care Economy'

The care economy entails a diversified range of productive work with both paid and unpaid work activities for providing direct and indirect care necessary for the physical, psychological, social wellbeing of primarily care dependent groups such as children, the elderly, disabled and ill, as well as for prime-age working adults (Figures 1 and 2).

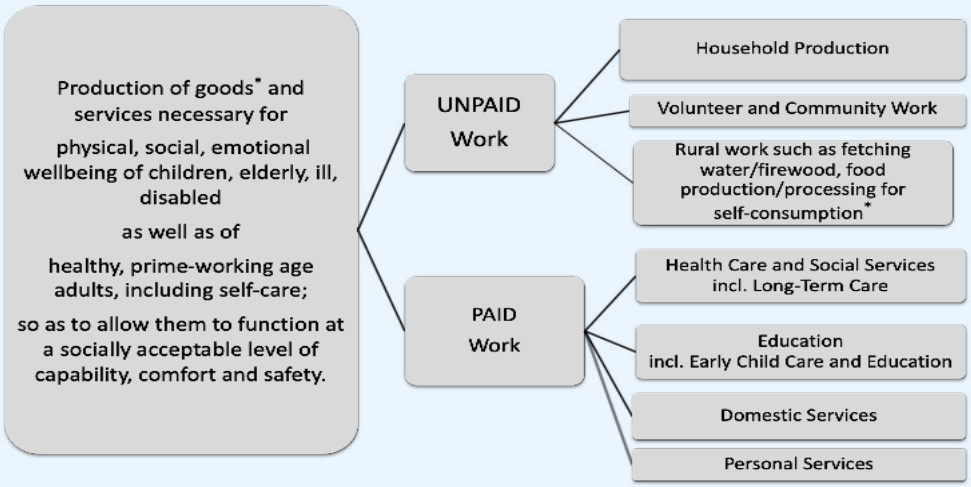
A substantial amount of care work is performed on an unpaid basis in the domestic sphere (household production). There is also substantial amount of unpaid work performed in less developed rural contexts such as fetching water, collecting firewood, food production and processing for self-consumption, which supports care activities. Community and volunteer work entail another form of unpaid work. An estimation by the ILO (2018) shows that unpaid care work for household production entails 16.4 billion hours of work time annually (equivalent of approximately 2 billion jobs (assuming an 8-hour work day). Three quarters of these unpaid work hours are performed by women. Care work is also performed on a paid basis in the public or market spheres, in healthcare and social services, education, domestic and personal services. According to ILO (2018) estimates, the size of the paid care economy corresponds to 381 million jobs around the world, compromising 11.5 per cent of global employment. Two thirds of paid care workers are women. (Figure 1).

Direct care work is person-to-person provisioning of services. In terms of unpaid domestic work, it can be bathing or feeding a baby or a long-term ill person, helping a child with homework or accompanying an elderly or disabled person on a doctor's visit. In terms of paid direct care work, it entails the activities of care workers employed in care sectors such as teachers, doctors, nurses or babysitters. Direct care work is labour intensive and given the requirement of person-to-person contact, there is limited room for mechanization. Indirect care work is production activities that support direct care provisioning without necessarily person-to-person contact, such as cleaning, washing, cooking, shopping or managing house. In terms of paid indirect care work, it entails the non-care workers employed in care sectors such as administrators, cleaners, transport/security workers or domestic workers. In a less-developed rural context, activities that support indirect care also entail unpaid productive activities such as fetching water or firewood, food production and processing for self-consumption (Figure 2).[2]

Investing in the care economy can be through a variety of means and policy interventions that improve households' access to quality care, whether paid or unpaid, direct or indirect. For example, expansion of care services for children, the elderly, disabled and ill, introducing legislation on care leave and improving its implementation, establishing insurance schemes for care leave to cover the self-employed, enacting flexible work practices or shortening of full-time employment hours for better work-life balance (see UN Women 2018 for a detailed discussion). This policy tool focuses in particular on expansion of care services, entailing both direct and indirect care, produced in or outside of the household, but provided by paid labour.

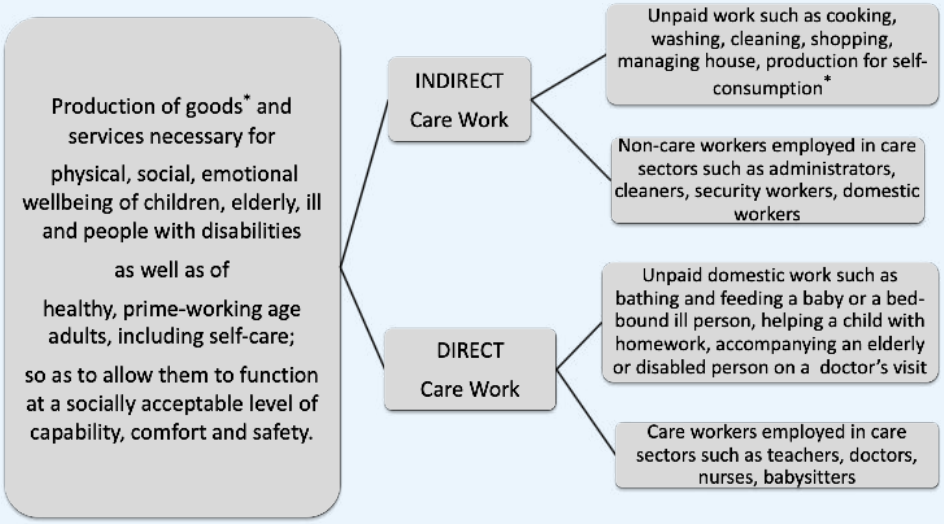
[2] Unpaid work is also be differentiated by inclusion in versus exclusion from the System of National Accounts (SNA). To the extent that unpaid work activities are included in the SNA, they acquire some visibility; they are included in conventional statistical measures as productive work. While unpaid work in rural contexts (such as fetching water/firewood or food production for self-consumption) is included in SNA accounts, other forms of unpaid work are excluded from the SNA.

Figure 1. Defining the Care Economy – Unpaid and Paid Work



* ILO (2018) defines care work as limited to services production only, in order to ensure consistency across the frameworks of the International Convention on Labour Statistics (ICLS 2013), the International Classification of Time Use Activities (ICATUS 2016) and the System of National Accounts (SNA 2008). Time spent in production of goods for self-consumption is considered unpaid work but not unpaid care work (see ILO 2018, p.9, Table 1.1).

Figure 2. Defining the Care Economy – Direct and Indirect Care



* See note under Figure 1, on the relation between goods production, care work and unpaid work.

The scope of what is meant by care services in this policy tool, derives upon a comprehensive conceptualization by ILO (2018). This includes a wide spectrum of services provided by diverse workers such as doctors, nurses, therapists, health aides, early-education specialists, primary and secondary school teachers, childcare and domestic workers.[3] The care

[3] This conceptualization is based on the following definition of 'care work' by Esquivel (2014): "Care work constitutes a subset of service work, characterized by interpersonal relations and face-to-face services that contribute to the development of the human capabilities of the care recipient ("nurturance")."

services which establish the target for public investments within the scope of the policy support tool, entail the following sectors of economic activity:

Education Services Sector:

- Early childhood care and education (ECCE)
- Primary and secondary education

Health Care Services Sector:

- Ill/patient care (short-term care)
- Long-term care for the elderly and people with a chronic disability and illness (LTC)

II.B. Framing the Assessment of Economic Returns to Care Investments

There are a variety of approaches to assessing the economic outcomes of care service expansion, reflecting its multiple economic and social returns. Economic returns to care investments take place through both supply and demand side channels as shown in Figure 3. Up until recently, most studies and policy discussion focused on the labor supply side effects of access to care services. For workers with care responsibilities (predominantly women), access to care services alleviates the time constraints on their labour supply. This improves (female) labour force participation and labor market attachment. The studies which attempt to identify the impact of access to care services on women's labour supply, commonly apply an econometric model to estimate the change in the probability of labour force participation (see for example, Apps and Rees 2004 and 2005; Del Boca and Pasqua 2005; Del Boca and Sauer 2006; Del Boca and Vuri 2007). There are also estimations of potential GDP growth (supply-side growth) consequent to increases in female labour force participation (see for example, the widely quoted McKinsey 2015 study).

Another supply-side channel becomes operational through expanding child-care and preschool services and the consequent long-run effects on human capital enhancement (Figure 3). This approach emphasizes the critical role that early childhood care and education services play in the physical, social, and mental development of children, preparing them to succeed in school and adult life. Hence, investment in early childhood care services has potential long-run growth-enhancing effects through improved quality of human capital that can be identified through the internal rates of return as well as equity enhancing effects through improved social mobility (see for example, Conti and Heckman 2012, Heckman, Pinto, and Savelyev 2013; Heckman, et.al. 2010). Other supply-side effects pertain to improved labour productivity of workers, particularly with care responsibilities through access to better work-life balance. These productivity enhancing supply-side effects culminate in supply-side growth (Figure 3).

A number of recent empirical studies which establish the main motivation for this policy support tool (listed in Table 1), approach the issue from a demand-side perspective and within a macroeconomic framework. They focus on short-run economic returns through job generation directly in the care sectors as well as indirectly in other related sectors through backward linkages (Figure 3). Their findings show that, given the substantially higher labour intensity of care work, each dollar spent on the care sector has the potential to generate 2 to 3 times more jobs than if the same dollar was to be spent on other sectors such as physical infrastructure and construction (a common target of fiscal stimulus spending). The higher jobs generation facilitates improved wage earnings and hence stimulates short-run demand-side growth.

Given the gender composition of care employment, care services expansion creates new jobs particularly in female-dominated occupations and sectors. As such it promotes gender equality also through the labour demand side. Overall we can say that expansion of care services facilitates the narrowing of gender economic gaps through a double-pronged mechanism that becomes operational both on the supply and the demand side: It alleviates the time constraints on women's labour and improves female labour force participation; while simultaneously creating jobs in female-dominated sectors and generating demand for women's labour (Figure 3).

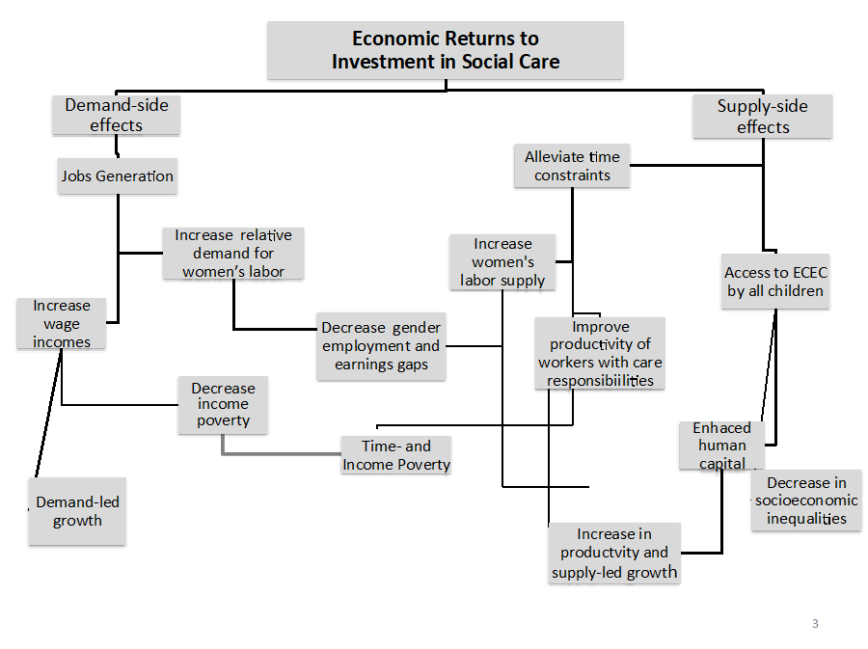
Finally, there are also demand side effects on poverty alleviation. Spending on care services creates a substantial number of jobs and generates labour earnings, which reduce the risk of poverty. Care expansion also promotes dual earner

households, who are exposed to lower poverty risk than single male breadwinner households, On the supply side, the lower requirements on unpaid work time implies that time poverty is also reduced. Overall the expansion of care services facilitates a simultaneous reduction of time- and income poverty.

As mentioned above, this tool focuses particularly on evaluating the short-run demand-side effects in terms of decent employment creation, gender equality, and poverty alleviation, as well as fiscal sustainability. The reason for focusing on short-run demand side effects is based on the objective of addressing fiscal policy design (particularly in the context of stimulus and bail-out packages under the current Covid-19 related economic crisis) and its implications for inclusive growth, resilient recovery and gender equality. Public budgets are designed on an annual basis and hence the returns to public spending within the short-run play an important role in allocation decisions. The identification of demand-side returns to investing in care, essentially explores a short-run economic rationale to public investments in care for providing solutions to jobless growth, high unemployment, low labour force participation, and rising poverty.

The next section provides an overview of this research and the last section (Section VI) discusses in more detail the analytical frameworks and methodologies, which are employed in assessing these demand-side returns to investing in care.

Figure 3: Economic Returns to Investing in the Care Economy: Supply and Demand-side Channels



II.C. An Overview of Applied Studies

There are a series of applied studies on demand side effects of investing in social care which emerged in the 2010's. They typically undertook an assessment and costing of the coverage gaps in various sub-sectors of care services and evaluate the economic returns to public investments. A full list of studies and their main features is provided in Table 1 and a detailed review can be found in the Appendix. This section focuses particularly on the studies by the ILO and UN Women.

Most studies listed in Table 1 are conducted on a country basis and focus either on ECCE or LTC given these are the two sub-sectors where the coverage gaps are the widest. ILO (2018) is the most comprehensive study both in terms of global

coverage as well as the coverage of care service sectors. It assesses the coverage gap in 45 countries[4] across all levels of education (ECCE, primary, secondary and tertiary) plus health care services in terms of both short-term ill/patient care and long-term care for older persons and people with a chronic illness or disability. The care coverage gaps are identified and costed against specific policy targets derived from sustainable development goals (SDGs) for the year 2030. Accordingly, ILO (2018) finds that for these 45 countries to achieve SDG targets in education and health, there is a need for increasing expenditures on care services by an additional 3.5 per cent of their total GDP. Through an analysis of the employment generation impact, the study also shows that an increase in spending of this magnitude has the potential to create over 117 million new jobs directly in the education and health care sectors (including ECCE and LTC) and indirectly in other interlinked sectors. More than half (55 per cent) of these jobs are likely to go to women.

UN Women (2019a) covers three countries (South Africa, Turkey and Uruguay), while UN Women (2019b and c) focus on Kyrgyzstan and Macedonia respectively. All undertake an assessment of the coverage gap with respect to ECCE services against a policy target of universal coverage. The total cost of closing the ECCE gap is estimated to range from at a minimum of 2.8 per cent of GDP (Uruguay), to at a maximum 3.7 per cent of GDP (Turkey). The additional direct and indirect jobs generation would increase employment by 3.0 percentage points at a minimum (Kyrgyzstan) to as much as 6.3 percentage points (S. Africa), with at least two thirds of these new jobs employing women. The fiscal returns (increase in tax revenues as a result of new employment and income generation) are estimated to be substantial, with the initial outlay of expenditures being self-financed at a rate of 26 per cent at a minimum (Kyrgyzstan) to as much as 51 per cent (Uruguay).

As can be seen in Table 1, under 'economic returns assessed', some of the studies present further analysis of demand-side economic outcomes of investing in care beyond that of employment generation, such as the impact on income distribution and poverty reduction or the impact on macroeconomic growth and productivity. These are discussed in Section IV and also in the Appendix.

[4] The countries are those which have the available data for analysis of employment generation impact of investing in care service expansion. These are predominantly high- and middle-income countries, including most countries in the OECD and account for 85 per cent of global GDP and close to 60 per cent of global population (workforce) (see the background paper for ILO 2018: Ilkkaracan and Kim 2019, p.5).

Table 1: Applied Demand-Side Studies on Investing in Care

Study	Country	Care Sector	Assessment and Costing of Care Coverage Gaps (CCG)	Economic returns assessed	Methodology
Antonopoulos and Kim (2008), Levy Economics Institute	S. Africa	ECCE and HIV patient care (home- and community-based health care for permanently or long-term ill)	CCG assessment on the basis of no of children Costing on the basis of no of employees to serve the children	Jobs generation and distribution by gender; income generation and distribution by gender, education and HH income; poverty reduction; economic growth	Social Accounting Matrix gender-disaggregated Microsimulation Comparison to physical infrastructure spending
Antonopoulos, et.al. (2010), Levy Economics Institute	USA	ECCE and home-based health care	No CCG assessment or costing Arbitrary assumption of 50 billion USD	Jobs generation and distribution by gender; income generation and distribution by gender, education and HH income; poverty reduction	Input-Output analysis and Microsimulation Macro growth omparison to physical infrastructure spending and green energy spending
Ilkkaracan, Kim and Kaya (2015) Istanbul Technical University and Levy Economics Institute; ILO, UNDP and UN Women	Turkey	ECCE	Detailed CCG and cost assessment based on nationally contextualised policy targets and local field survey	Jobs generation and distribution by gender; income generation and distribution by gender, education and HH income; poverty reduction	Input-Output analysis and Microsimulation Comparison to physical infrastructure spending and to social transfer spending
Kim, Ilkkaracan, and Kaya (2019)	Turkey	ECCE	CCG and cost assessment based on Ilkkaracan, Kim and Kaya (2015)	Jobs generation and distribution by gender; gender employment and wage gap, gender jobs segregation	Input-Output analysis and Microsimulation Comparison to physical infrastructure spending and to social transfer spending
De Henau, et.al. (2016), ITUC	Australia, Denmark, Germany, Italy, Japan, USA	ECCE and long-term care	No CCG assessment or costing Arbitrary assumption of 2% GDP	Jobs generation and distribution by gender; growth	Input-Output analysis CAM macro modeling Comparison to construction spending
De Henau, Himmelweit and Perrons (2017), ITUC	Brazil, China, India, Indonesia, S. Africa	Health and social care	No CCG assessment or costing Arbitrary assumption of 2% GDP	Jobs generation and distribution by gender; growth	Input-Output analysis Comparison to construction spending
Bargawi and Cozzi (2017)	The Eurozone countries + the U.K.	ECCE		Jobs generation and distribution by gender; economic growth, public budget deficit and debt	Cambridge- Alphametrics macro-simulation Model (CAM)

Study	Country	Care Sector	Assessment and Costing of Care Coverage Gaps (CCG)	Economic returns assessed	Methodology
ILO (2018) and ILO background paper Ilkkaracan and Kim (2019),	45 countries	ECCE, primary, secondary and tertiary education; Health care; long-term care	Detailed CCG and cost assessment based on policy targets as set by SDGs and analysis of cross-country data	Jobs generation and distribution by gender; short-run fiscal sustainability via tax revenues	Input-Output analysis
De Henau, et.al., UN Women (2019a)	S. Africa, Turkey and Uruguay	ECCE	CGG assessment and costing based on national data	Jobs generation and distribution by gender; short-run fiscal sustainability via tax revenues	Input-Output analysis
Ilkkaracan and Kim , UN Women (2019b)	Kyrgyzstan	ECCE	Detailed CCG and cost assessment based on national policy targets and data	Jobs generation and distribution by gender; short-run fiscal sustainability	Input-Output analysis
De Henau and Mojsoska-Blazevski UN Women (2019c)	Former Yugoslav Republic of Macedonia	ECCE	Detailed CCG and cost assessment based on national policy targets and data	Jobs generation and distribution by gender; short-run fiscal sustainability	Input-Output analysis
Zacharias, et.al. (2019) 0.33-0.66% GDP on ECEC based on no of children (31% enrolment and teacher skills upgrading; 100% for 5-6 year olds)	Ghana and Tanzania	ECCE and Physican Infastructure (the Public Road Network)	Detailed CCG and cost assessment based on national policy targets and data	Growth, public debt, trade deficit; tax revenues, employment creation and time- and income poverty by gender	Social Accounting Matrix CGE modelling and and Microsimulation using combined time- and income survey micro data
Ilkkaracan, et.al. (2020)	Turkey	ECCE	CCG and cost assessment based on updated Ilkkaracan, Kim and Kaya (2015)	Jobs generation and distribution by gender; income generation and distribution by gender, education and HH income; impact on time constraints and time- and income-poverty reduction	Input-Output analysis and Microsimulation using combined time- and income survey micro data
Oyvat and Onaran (2020) Onaran. Oyvat and Fotopoulou (2019)	S. Korea (and UK)	ECCE / Education	No CCG and cost assessment; exploration of reactions of macro outcomes to a stimulus of increased public spending on care services	Growth, productivity, unemployment	Post-Keynesian macro modelling and simulation

III. Assessing and Costing Care Coverage Gaps

This section provides a general guideline for assessing the coverage gaps in care services and their costing. The next section (IV) presents the specific implementation of this general guideline in the education sector by different categories of education (early childhood care and education, primary and secondary education). Section V presents its implementation in the healthcare and the long-term care sectors.

III.A. Assessing Care Coverage Gaps

The assessment of public investment needs in the care economy comprises of two fundamental steps: An assessment of the care coverage gap(s) in given sub-sector(s) of care services and an assessment of the costs required to eliminate the care coverage gap(s).

The discussion of coverage gaps should be set against a background which entails an overview of the social care systems in the country (such as an overview of ECCE or long-term care services). This overview should include:

- Legislation on who has the right to access, who has the responsibility to provision (national or local governments), staffing and other quality requirements, monitoring systems;
- National plans and government policies;
- Existing norms, practices, standards (such as childcare being predominantly dependent on grandparents; or elderly care on migrant domestic workers);
- Prevailing coverage rates and employment levels, quality measures, staff wages, expenditures disaggregated by public vs. private services.

Against this background, the gap analysis of the care deficit constitutes of five steps. These steps and related data needs are shown in Table 2. The assessment requires gathering information on existing supply of versus potential demand for care services. Supply is reflected in the number of people in the relevant category with access to institutional or home-based professional care disaggregated by public and private services plus – if any- excess capacity with the institutions that provide these services.[5]

Demand at a minimum is the realized demand as reflected in the current utilization of services. Potential demand needs to be evaluated against the choice of different policy targets. At a maximum, demand would be universal coverage for the entire target population who potentially need a particular type of care, for example, universal access to childcare for all children under the mandatory school age. More narrowly defined, demand estimation could be made with respect to certain criteria relevant to the country context, for example, the regional best coverage rates for the region where the country is located.

The relevance of policy targets would be evaluated against:

- Current starting levels in the country;
- Government self-stated targets if any;
- Relevant regional/cross country coverage rates (choosing the best or average rate in the region);
- High performing country coverage rates;
- International criteria such as the Sustainable Development Goals (SDGs).

[5] If there is any excess capacity in services, the reasons need to be explored: affordability of services, geographical distribution and proximity to service centers, etc.

Short-run policy targets can be limited to disadvantaged households and regions[6] both in terms of service delivery and employment creation. Nevertheless, ideally the long-run policy target should be universal coverage by public provisioning or subsidized services.

The care coverage gap reflects the difference between estimated potential demand and current supply; or more explicitly, the number of potential care beneficiaries who would need to be covered by service provisioning in order for the country to achieve the policy target minus the number of care beneficiaries who already have access to services. This yields the number of additional care places to be created for the assessed need to be met.

$$CCG_{agegroup} = (P_{agegroup} \text{ x } t.c.r._{agegroup}) - (P_{agegroup} \text{ x } c.c.r_{agegroup}) \quad (1)$$

Total CCG = Sum of CCG over all age groups

CCGagegroup = Care Coverage Gap per age group (measured in no of additional people to be covered)
P = Population
t.c.r. = target coverage rate (desired share of care beneficiaries in the total population)
c.c.r. = current coverage rate (prevailing share of care beneficiaries in the total population)

In the above, the care coverage gap is defined in terms of outreach to a target number of care receivers. It is also possible to identify the gap with respect to quality criteria of the existing level of services. This means existing service provisioning falls short of certain quality requirements. A common indicator of service quality is the ratio of care beneficiaries to care service providers, for example number of children per teacher. If the prevailing ratios fall short of desired policy targets, then the care coverage gap can also entail the additional number of service providers necessary to achieve the quality targets.

$$CCQG_{agegroup} = CSB_{agegroup}/t.s.r._{agegroup} - CSP_{agegroup} \quad (2)$$

Total CCQG = Sum of CCQG over all age groups

CCQG = Care Coverage Quality Gap (measured in no of additional service providers or care workers to be employed)
t.s.r. = target service ratio = No of service beneficiaries per service provider
CSB = No of current service beneficiaries
CSP = No of current service providers

[6] 'Disadvantaged' status should be determined by the relevant country context; disadvantaged in reference to the national poverty line, or in terms of belonging to minorities or other relevant criteria.

Table 2: How to Assess Care Coverage Gaps

Task	Data Needs	Comments
1. Determine policy targets	Target coverage rates; Target service beneficiary-to-provider ratios; Other target quality indicators (educational qualifications of service providers or centre related issues)	Look in: SDGs; High performing country indicators; Regional-best indicators Government targets; International indicators by inter-governmental or specialized agencies.
2. Identify current supply	Current coverage rates or number of service beneficiaries; Excess (unutilized) capacity in services (by age groups)	
3. Determine potential demand	Population (by age groups); Target coverage rates.	
4. Find the coverage gap	1, 2 and 3 above	Difference between Supply and Demand: Additional number of care service receivers to be covered to achieve quantity targets
5. Find the quality gap	Existing and target service beneficiary-to-provider ratios; Any other existing and target service quality measures.	Difference between target and existing quality measures: Additional number of care service providers to be hired to achieve quality targets; Necessary skills upgrading; Necessary other upgrading of services.

III.B. Costing Care Coverage Gaps

The second step is to estimate the costs involved in undertaking an expansion and/or upgrading of care services in order to meet the care gaps assessed in the first step. The various steps involved in costing of the care coverage gaps are shown in Table 3. This requires first of all, an identification of unit costs: the average prevailing cost of social care provisioning per beneficiary per year, which can be obtained by:

$$Current\ Cost\ per\ Beneficiary = \frac{Current\ Sectoral\ Expenditures}{Current\ No.\ of\ Beneficiaries} \qquad (3)$$

The sectoral expenditures can be found from relevant public agencies, in particular the national or relevant ministry budget allocations, or an umbrella organization of service providers (for example, association of child-care centres) or other sources such as input-output data.[7] Alternatively, the cost can also be derived on the basis of the necessary number of care workers (e.g. teachers and assistant teachers) to be employed, their foreseen wage levels, and non-wage (overhead costs) per beneficiary or per service provider. If no data exists, it can be obtained on the basis of a field survey of existing service providers (see for example the Turkish study by Ilkkaracan, Kim and Kaya 2015 or the Ghana and Tanzania study by Zacharias, et.al. 2019).

Once the prevailing unit cost is obtained, it also becomes imperative here to consider whether current (observed) costs per beneficiary reflect the desired quality in service provisioning from the beneficiary perspective and also the desired employment quality (namely decent wages) from the care worker perspective. If it is deemed that current service quality and/or work/pay conditions are poor, then the observed (prevailing) unit cost should be adjusted so as to reflect additional expenditures for improving the quality of services and quality of employment. If there are such quality considerations, the

[7] To give an example, the expenditures on ECCE services are usually available from the Ministry of Education, which presents the Ministry annual budget disaggregated by the level of education. These are public expenditures which would need to be divided by the number of children enrolled in public ECCE centers to find the per child cost. Input-Output data is explained in Section VI

prevailing unit cost would need to be revised, for example for lower service receiver-to-service provider ratios and/or for better wages for care workers.

The adjusted per beneficiary unit cost is then multiplied by the additional number of people in need of care services (derived from the first step) to estimate the total cost of necessary expenditures:

$$Total\ Cost = (per\ beneficiary\ unit\ cost\ adjusted\ for\ service\ and\ employment\ quality) \times (additional\ number\ of\ beneficiaries\ to\ be\ covered) \quad (4)$$

It should be noted that in the assessment of the care coverage gaps and its costing in line with service quality and decent employment criteria, there is a need to make a series of specific assumptions and judgment calls. These can be formulated so as to better reflect objectives and targets as identified by beneficiary communities and multiple stakeholders at the national, regional and local levels. In ILO (2018), the per beneficiary costs were adjusted to reflect decent wages for care workers in line with the policy target of SDG 8 on decent employment (see Ilkkaracan and Kim 2019 p.16-17 for a detailed discussion). For adjusting the care coverage gap costing in education, for example, teacher salaries were compared to average salaries of tertiary educated workers and where lower, they were revised upward. Total wage expenditures for teachers were calculated using the revised salary (see Section IV for further discussion).

▶ **Table 3: Costing the Care Coverage Gaps**

Task	Data Needs	Comments
1. Determine prevailing unit cost	Sectoral expenditures; Wage costs vs. non-wage costs; Existing no. of beneficiaries.	Look in: Public budgets; Umbrella organizations of service providers; IO data; Field surveys.
2. Adjust unit cost for service quality criteria	Existing and target service receiver-to-provider ratios; Any other existing and target service quality measures. (see Table 1)	
3. Adjust unit cost for employment quality criteria	Existing and target wage levels.	Wage adjustments can be done by comparing existing earnings in care occupations to other measures of earnings such as the median wage in all occupations or GDP per capita and setting target wages at multiple of various wage measures.
4. Find the total cost	No. of additional service receivers to be covered (see Table 1); 2 and 3 above.	

III.C. Contextualizing Costs within the Fiscal and Macroeconomic Policy Framework

Once the scope of necessary additional spending is determined, it would be useful to assess its magnitude with respect to the patterns of fiscal expenditures and the macroeconomic policy framework prevalent to the country context. This is important because the case for public investment and expenditures, particularly as a countercyclical macroeconomic tool, is embedded in macroeconomic policy debates (see Box 1).

Total costs can be expressed with respect to (and as a share of):

- GDP (current or projected);
- total public expenditures;
- relevant public budget items such as total education or health expenditures;

- alternative public budget items such as expenditures on physical infrastructure;
- the total amount of a fiscal stimulus package and its line allocations.

This enables an assessment of the magnitude of fiscal spending required relative to existing patterns of spending. Such an undertaking can also be situated along a time dimension, exploring how public expenditures on the relevant care sector has changed relative to GDP or various expenditure categories as above. The projected expenditures necessary for closing of the care coverage gap can be rolled out in phases; the spending can increase gradually over several years to finally reach the desired annual amount. This would mean planning the service expansion in different phases along with national priorities, for example, initially covering disadvantaged groups or regions.

An evaluation of the necessary additional spending to eliminate the care coverage gap can also be contextualized with respect to the fiscal space in central and local budgets. If there is a fiscal expansion in the country; in particular, if there is s fiscal stimulus package in question, the (planned or realized) allocation of expenditures can be evaluated in terms of the share (if any) of social care expenditures. This would serve as an indicator of the gender responsiveness of the stimulus package. In a similar vein, if there is a fiscal contraction, the cuts in public spending can be evaluated again with an assessment of what is happening with reductions in care service expenditures (if any) versus reductions other lines of spending.

▶ Box 1. Public investment and expenditures as a countercyclical macroeconomic tool

The case for increased public investment and spending to counteract an economic crisis is based on a Keynesian macroeconomic framework. Keynesian theory argues that the primary source of low growth and high unemployment lies in deficiency of effective demand, which in turn deters private investment. The government needs to intervene with fiscal policy (namely increasing public expenditures) in order to activate aggregate demand in the economy, to boost employment and aid economic recovery. The demand activation and employment creation would not happen only in the sectors where the government spends money but also in other sectors through what Keynes called 'the spending multiplier' effects.

Most Keynesians, however, used to approach the issue from a macroeconomic growth perspective and did not pay attention to the question of where the public expenditures should be directed; it could be spent in any manner as long as the overall level of spending in the economy would be maintained. In the long-run, increasing effective demand by spending on capital investment is better, because it improves productivity and boosts long-run production capacity (i.e. growth).

Some macroeconomists, including feminist economists, in recent years have increasingly emphasized that **where** you spend makes a huge difference in terms of the effectiveness of the fiscal policy intervention in maintaining growth and lowering unemployment. Also they are critical of the human and gender bias in classifying only capital and physical infrastructure expenditures as investment expenditures; they argue education and health expenditures are forms of human investments that also entail future productivity gains. Hence they interpret the case for public investment and expenditures as a countercyclical tool in a more expanded framework with significant nuances. They make the case for spending on labour-intensive service sectors such as health and education as an appropriate target both for its higher employment multiplier than other forms of sectoral spending, as well as its capacity to improve a multitude of economic and social goals such as gender inclusive growth and long-run productivity through enhanced human capital. In the context of the post-Covid19 recovery interventions, the case for increasing budget allocations to care services has become even more urgent.

Sources: Elson (2013); Ilkkaracan (2013); Kim and Ilkkaracan (2019); de Henau, et.al. (2016) and (2017); UK Women's Budget Group Feminist F Plan (2015); ILO (2020).

IV. Care Coverage Gaps and Costing in Education

IV.A. Early Childhood Care and Education (ECCE)

The bulk of care provisioning for children under the mandatory school age is undertaken by unpaid work of mothers, fathers, family and friends. This section considers the expansion of ECCE services through formal centre-based and paid care services organized and/or controlled by a public or private entity.

The ECCE coverage gap reflects the difference between 'the number of children who would need to be enrolled in a childcare centre or preschool in order for the country in question to achieve the policy target' (such as the enrolment rates of the best-performing country in the region) minus 'the number of children who are currently enrolled in a childcare centre or preschool' (see equation 5 below for each age group). This yields the number of additional ECCE places to be created for the assessed need to be met.

The ECCE targets are set by age groups for young children in the 0-2 age group and for the older children in the 3 to mandatory school age group. The mandatory school age in most countries is 6 or 7 years old. As such the targets need to be set by two or three groups:

- Age 0-2 (day nurseries/crèches)
- Age 3-5 or 3-6 (preschools/kindergartens)
- Age 6 or 7 (school preparatory classes prior to the mandatory school starting age).

The last category of school preparatory classes is considered in most places part of the primary school system and most national legislations mandate universal coverage as in primary schooling, although attendance maybe on a part-time basis.

There are different reference points for setting the policy target enrolment rate for the first 0-2 and 3-5/6 age groups, which can be seen in Table 4. As an international target, the SDG indicator 4.2.2 (under SDG 4 on Education for All) foresees minimum 1 year of preschool education for all children under the mandatory school age. The ILO (2018) study, which depicts a high-road care services scenario, suggests a more progressive interpretation of this by setting the targets at 50 per cent for the 0-2 age group and 100 per cent for the 3-to-mandatory school age group.

For younger children, the target of 50 per cent is derived on the basis of the best-performing countries, which are identified, not on the basis of the highest enrolment rates but rather on the basis of the lowest use of informal childcare services. The reasoning here is as follows: It is acknowledged that quality care for young children entails a combination of complementary home-based (predominantly parental/family) and institutional care. There will be more reliance on the former particularly for children 0-12 months old, followed by increasing enrolment in the latter phase of 12-36 months. The study argues that given this complementarity,

> *"the best-performing countries cannot be simply identified on the basis of highest enrolment rates in childcare centres. Rather for this young age group, coverage should be defined as a combination of access to formal childcare institutions as well as parental care subsidized through care leave insurance (for both wage and salary workers and for self-employed workers) or care allowance"* (Ilkkaracan and Kim, 2019a, p.10-11)

Following this reasoning, the best performing countries are identified on the basis of the lowest use of informal childcare (defined as care provided by grandparents or other relatives/friends/neighbours without payment). In the case of the 45-country study in ILO (2018), the OECD was taken as a point of reference.[8] The OECD countries have an average rate of 24

[8] It is possible to derive the target enrolment rate on the basis of the best-performing countries in the region. This was one of the approaches adopted in the study on Kyrgyzstan (Ilkkaracan and Kim 2019 or UN Women 2019b).

per cent utilization of informal childcare. The lowest use of informal childcare and the corresponding 0-2 enrolment rates are in the following countries:

- Norway (0 per cent; 55 per cent)
- Finland (0.3 per cent; 28 per cent)
- Sweden (2.2 per cent; 47 per cent)
- Denmark (5.2 per cent; 65 per cent)

The target 50 per cent enrolment rate for the 0-2 age group, represents a weighted average of these four best-performing countries. The policy target of 100 per cent enrolment rate for the 3-5 age group, derives from the fact that the majority of high- and upper-middle income countries have achieved universal coverage for this group and an important number of countries have legislation that mandate universal access to preschool education for this age group (Ilkkaracan and Kim, 2019a, p.12).

The Education Coverage Gap in ECCE (ECG-ECCE) would be given by the following:

$$ECG\text{ - }ECCE = (Child\ Population_{agegroup}\ x\ Target\ Enrolment\ Rate_{agegroup}) - Enrolled\ Children_{agegroup} \quad (5a)$$

In ECCE, the age groups are conventionally categorized as 0-2 and 3-to-mandatory school age (5 years old or 6 years old in most countries). The education coverage gap in ECCE would yield the additional number of spaces to be provided at childcare centres and preschools in order to reach the policy target enrolment rate.

Beyond enrolment rates, the quality targets in education are as important; particularly in ECCE where parents are more likely to abstain from using services unless they have full trust in the service quality. Common measures of service quality are student-to-teacher ratio and class/group size again varying by age group. In addition, teacher qualifications and competitive salaries serve as a quality indicator of both employment and services. Some reference targets for these measures are presented in Table 5. There is a wide range here similar to the case of target enrolment rates for age 0-2. For example, for student-to-teacher ratios, the targets range from 3 children age 0-12 months per teacher, and 5 children age 1-2-year-old per teacher as foreseen in some national benchmarks, to 10 children age 0-2 per teacher as foreseen in UNESCO (2015). Learning materials and administrative support is another component of quality, although more difficult to capture in a single measure (to be discussed under costing below).

The discussion of coverage gaps and quality indicators in ECCE (and education overall) should be accompanied by a discussion on relevant legislation on ECCE addressing issues such as who has the right to public ECCPE; who has the responsibility for provisioning, for example, national or local governments; who oversees/licenses private centres; what are the requirements on student-teacher ratios, teacher qualifications, class/group size, requirements for support staff such as teaching assistants, administrative staff, teaching materials, and school buildings and grounds, etc.

IV.B. Primary and Secondary Education

For primary and secondary education, setting target enrolment rates is straightforward as almost all countries have legislation on mandatory primary education and a majority of countries have legislated mandatory secondary education. SDG 4.1 defines clear targets here unlike ECCE. SDG 4.1 foresees that all children should have access to free and quality primary and secondary education.

Given the target of universal primary and secondary schooling, the education coverage gap at the primary and secondary levels is simply the difference between the child population in the relevant age group and the number of children/students already enrolled in each level of education.

$$ECG\text{ - }Primary = Child\ Population_{primary} - Enrolled\ Students_{primary} \quad (5b)$$

$$ECG\text{ - }Secondary = Child\ Population_{secodnary} - EnrolledStudents_{secondary} \quad (5c)$$

The education coverage gap shows the additional number of children to be enrolled in primary or secondary schooling in order for the universal enrolment target to be met.

Another important factor to consider in assessing the education coverage gap at the primary and secondary levels entails additional support for marginalized and disadvantaged children (such as refugee children), namely free uniforms, tuition support, mother-tongue instruction, construction of remote or mobile schools for hard-to-reach children or support for disabled children. Moreover, the disruption to education caused by the Covid-19 crisis also calls for a consideration of the types of gaps caused under shocks and the necessary allocation of funds to build the educational system's resilience against such shocks (see Box 2).

Box 2. COVID-19 and Coverage Gaps in Education

The COVID-19 crisis has resulted in the largest disruption of education systems in history, affecting more than 1.6 billion students around the world. The crisis is further deepening the existing inequalities in access to education, buy reducing opportunities particularly for the disadvantaged children and youth, living in poorer households and regions. At the same time, the crisis provided educators with an opportunity to rethink how teaching and learning work, and stimulated innovation in the education sector. A 'blended approach', combining traditional face-to-face learning with online modalities, could very well be 'the new normal' as schools reopen, offering a chance for many marginalized learners to be increasingly and equitably included in education. Setting of the priorities listed below would significantly contribute to the level of success in maximizing learning outcomes for all children.

- Providing financial support to Ministries of National Education to reduce barriers in accessing online learning for all children and ensuring that national strategies using television or radio broadcasts and online platforms can reach all children, especially the most vulnerable and those at risk of dropping out.
- Expanding the definition of right to education to include connectivity and ensuring that sufficient technical infrastructure is in place and connectivity is free or affordable;
- Supporting remote learning options for non-formal learners, marginalized and out-of-school minority children, such as refugees;
- Providing children and students with essential learning materials (stationary, pens, notebooks, laptops) for remote learning including those in non-formal education programmes and other vulnerable learners;
- Supporting the capabilities of teachers, administrators and staff in the education sector;
- Developing targeted, age-appropriate communication messages for students with different backgrounds and needs, families and teachers to support children's physical and mental wellbeing, the importance of education, and access to distance learning.

UN (2020) emphasizes the importance of protecting education financing and preserving the share of education expenditures as a top priority in the context of the Covid-19 crisis, in order for the above measures to be realized, towards the goal of leaving no one behind.

Source: United Nations (2020); The Education Reform Initiative, Turkey (2020)

Table 4. Setting Policy Target Enrolment Rates in Education (%)*

Age Group	ECCE		Primary	Secondary
	0-2	3-5		
Global average	44			
OECD average	35	84	100	100
EU average	31	85	100	100
EU Barcelona targets**	33	90		
SDG 4 SDG 4.2.2 for ECCE; SDG 4.1 for primary and secondary education	Minimum 1-year preschool for children under mandatory school age		100	100
ILO (2018)	50	100	100	100

* Enrolment rates are measured as the number of children enrolled as a share of the total population by age group. ** The Barcelona targets on early childhood care and preschool education, which were established by the European Commission in 2002, are the first (and other than SDG 4.2, the only) cross-country criteria specifying quantitative policy targets.

Table 5: Setting of Service and Employment Quality Targets in Education (%)

	0-2	3-5	Primary	Secondary
Students per teacher				
UNESCO (2015) ILO (2018)	10	15	31	28
Some high-quality national benchmarks	Max. 3 for 0-12 months; Max. 5 for 1-2 year olds			
Group size				
ILO (2013)	--	20	--	--
Teacher salaries				
ILO (2018)	4.5 times GDP per capita for low- and lower middle income countries; average salary of tertiary graduates for high- and upper-middle income countries			
UNESCO (2015) based on Wils (2015) for low- income countries	4.5 times GDP per capita			5.9 times GDP per capita

IV.C. Costing of Care Coverage Gaps in Education

Costing the education gap depends on two main elements:

- The number of additional spaces to be created for new child/student enrolment;
- The cost per child/student adjusted to meet quality criteria,

both disaggregated by age groups and level of education.

A baseline for cost per child/student can be identified by dividing the current level of government expenditures by the total number of children/students enrolled in the public education system separately for each level of education (0-2 and 3-5 ECCE, primary and secondary education). Here it is important to distinguish between full-time and part-time students in order to derive the per child/student expenditure on the basis of full-time enrolment per year. The expenditures need to be treated in two parts:

- Teaching staff wages and salaries, and
- Remaining overhead expenditures, which will include administrative staff wages and salaries and all non-wage expenditures including teaching materials, rent, maintenance, non-staff administrative costs.

Identification of the overhead component as a separate cost item would enable the derivation of the per child/student overhead costs separate from teaching staff wages and salaries. Hence the latter can be adjusted to reflect the desired child/student ratios and the wage/salary levels.

The necessary teaching staff wage and salary expenditures at each level of education i (where i = ECCE 0-2, ECCE 3—to-mandatory school age, primary, secondary) would be given by the following based on the education coverage gap ECG identified above:

$$\text{Total wage and salary expenditures for teaching staff}_i = \frac{ECG_i}{\text{Target Child/Student-to-Teaching Staff Ratio}_i} \times \text{Target Annual Salary per Teaching Staff}_i \quad (6)$$

The necessary overhead expenditures would be given by the following:

$$\text{Total overhead expenditures}_i = \frac{\text{Existing Overhead Expenditures}_i}{\text{Total No of Children/Students Enrolled Full-Time}_i} \times ECG_i \quad (7)$$

Total costs would be the sum of these two components:

$$\text{Cost of the } ECG_i = \text{Total Wage and Salary Expenditures For Teaching Staff}_i + \text{Total Overhead Expenditures}_i \quad (8)$$

Data requirements for assessing the care coverage gap and costing in education (including ECCE) are shown in Table 6.

▶ **Table 6: Data Requirements for assessing the Care Coverage Gaps and Costing in Education**

Data	Disaggregation by		Source
	Level of Education	Other	
Child population		By age group (if relevant also by gender and region)	National Statistics Agency, Population Statistics
Enrolment rates	ECCE, primary and secondary	By age group; public versus private; part-time versus full-time (or whatever relevant data on no of weeks/hours of enrolment per year); if relevant by gender and region	Ministry of Education Ministry for Social Services/Family for the childcare centres catering to 0-2 age group Teachers' Unions Field surveys and research reports
Child/student-to-teacher ratios and class/group size	ECCE, primary and secondary		
Teacher wages and salaries	ECCE, primary and secondary		
Average/median wages and salaries in the overall labour market		By education/skill level	Household Labour Force Surveys
GDP per capita			National account statistics
Government expenditures on education	ECCE, primary and secondary	By teaching staff salaries vs. overhead expenditures	Ministry of Education Budget Ministry for Social Services/Family Budget

The data should belong to the most recent year for which data is available and belong to the same year. Also, it would be good to present data on enrolment rates belonging to previous years (and comparable with most recent years) in order to enable an assessment of ECCE enrolment trends over time.

To the extent that this data is not identifiable from existing sources (which may be the case for ECCE), another possibility is to conduct a field survey of childcare centres and preschools. For a detailed discussion of such a field survey and the questionnaire, see Ilkkaracan, Kim and Kaya (2015).

Note that it may be necessary to make an adjustment also in overhead expenditures if the overview of the education system indicates quality problems with these non-teaching components of service provisioning. Such an adjustment would reflect improved ratios of student/child to administrative staff ratios, administrative staff wages and salaries and non-staff overhead expenditures

In the case of additional support for marginalized out-of-school children as mentioned above (uniforms, tuition support, mother-tongue instruction, construction of remote or mobile schools for hard-to-reach children or support for disabled children (or for example, access to internet in case of continued lock down measures under the Covid-19 pandemic), the gap assessment and costing would need to be customized according to the particular nature of the needs. An assessment by Wils (2015) for low and lower middle income countries defines marginalized children in need of additional support as children living under USD 2 per day; and finds that the additional expenses for their coverage corresponds to 20 per cent of the cost per child for pre-primary and primary education and 30 per cent for lower secondary education and 40 per cent for upper secondary education (Wils 2015, p.3).

V. Care Coverage Gaps and Costing in Health and Long-Term Care

V.A. Health Care

A competent health workforce of adequate size, optimally organized and distributed especially in rural and under-served areas, is crucial to the attainment of public health objectives and for the strengthening of health system performance and resilience (WHO 2016; Dublin Declaration 2017). The UN Secretary General's High-Level Commission on Health Employment and Economic Growth (2016) calls for increased and transformed investments in the health and social workforce, highlighting the benefits across multiple SDGs, including SDG 1: poverty elimination, SDG 3: good health and wellbeing; SDG 4: quality education; SDG 5: gender equality; SDG 8: decent work and economic growth.[9] The recent Covid-19 pandemic has shown how the deficiencies in health systems contribute to the vulnerability of people, societies and economies. The World Health Organisation has stated that the coronavirus pandemic has shown the importance of investing in health systems improving readiness to prevent and control outbreaks, and enhancing equitable access to care.[10]

V.A.1. Care Coverage Gaps in Healthcare

Assessment of health care coverage gaps can be conducted on the basis of required health personnel per population to meet the criteria set out by the SDGs, in particular SDG 3 on good health and wellbeing for all. This is different from the assessment of the education coverage gap, which was based on the number of additional spaces to be created in educational institutions for new children/students to be covered. In the case of health care coverage gaps, we follow the studies by specialized international agencies such as the World Health Organization (WHO) who utilize the shortage of

[9] https://www.oecd.org/newsroom/un-commission-new-investments-in-global-health-workforce-will-create-jobs-and-drive-economic-growth.htm

[10] https://www.aa.com.tr/en/africa/covid-19-shows-importance-of-investing-in-health-who/1952648

health workers in assessing the needs. The data needs for assessment of the healthcare coverage gaps and costing are summarised in Table 7.

To this end a recent assessment by the WHO (2016) entitled *Health Workforce Requirements for Universal Health Coverage and the Sustainable Development Goals* provides some targets. This is based on twelve key population health indicators[11] identified by WHO and the World Bank which is used to establish a composite index. The index is weighted according to the global burden of disease, and the minimum thresholds for health personnel is derived through regression analysis (WHO 2016, p.6).

Accordingly, the SDG index threshold is set at 4.45 health workers (doctors, midwives and nurses) per 1000 population indicative of the minimum density representing the need for health workers. This is a higher threshold than previous ones, for example 2.3 in WHO (2006), 3.4 in WHO (2010) or 4.1 in ILO (2014). The increase is explained as expanding the reference range of services, including non-communicable diseases. Higher thresholds also exist such the Ending Maternal Deaths Initiative, which sets the threshold at 5.9.

These thresholds refer to three primary categories of health workers: doctors, midwives and nurses. There are also what WHO (2016) calls "the other cadres" of health workers, categorized in seven groups: dentistry personnel, pharmaceutical personnel, laboratory health workers, environment and public health workers, community and traditional health workers, health management and support health workers, and other health workers which include medical assistants, dieticians, nutritionists, occupational therapists, medical imaging and therapeutic equipment technicians, optometrists, ophthalmic opticians, physiotherapists, personal care workers, speech pathologists and medical trainees (WHO 2016, p.9). The need for these other cadres is identified on the basis of a fixed ratio between the number of total health workers in the three threshold categories (doctors, midwives and nurses) and the number of health workers in the other cadres.

WHO (2016, p.11) reports the fixed ratio of the number of health workers in other cadres and the number of total health workers in the primary categories (doctors, midwives and nurses) disaggregated by income level. Accordingly, the ratio is 0.373 for high-income countries, 0.406 for upper middle-income countries, 0.549 for lower middle-income countries and 0.595 for low-income countries. WHO (2016) notes that "a renewed focus on a more diverse skills mix and a greater role for community health workers in some settings may conversely result in an increase of these relative to the number of nurses/midwives and doctors in future" (WHO 2016, p.6). Hence, the ratio should be identified based on the existing numbers of health employment and the specific needs in each country.

The health coverage gap can then be expressed as the additional numbers of health workers required for doctors, midwives and nurses to meet the minimum threshold (DMN) plus the additional numbers of health workers required in the other cadres to meet the fixed country specific ratio (HWOC).

$$Health\ Care\ Coverage\ Gap = DMN + HWOC \quad (9)$$

$$DMN = Population\ in\ 1000's \times 4.45\ Dctrs/Mdwvs/Nrs - Existing\ Employment\ of\ Dctrs/Mdwvs/Nrs) \quad (10)$$

$$HWOC = DMN \times Country\ Fixed\ Ratio$$

$$Country\ Fixed\ Ratio\ (CFR) = \frac{Existing\ Employment\ of\ Health\ Wrks\ in\ Other\ Cadres}{Existing\ Employment\ of\ Dctrs/Mdwvs/Nrs} \quad (11)$$

In the case where country specific data on the CFR may not be readily available, one can use the above-stated fixed ratios derived for ILO (2018) based on income level of the country.

[11] Twelve key population health indicators identified by WHO and the World Bank are family planning, antenatal care coverage, skilled birth attendance, DTP3 (diphtheria-tetanus-pertussis immunization), tobacco smoking, potable water, sanitation, antiretroviral therapy, tuberculosis treatment, cataract surgery, diabetes, and hypertension treatment.

V.A.2. Costing of Care Coverage Gaps in Healthcare

In order to do the costing of the health care coverage gap, we need data on public expenditures on health, the share of expenditures allocated to wage and salary payments to health workers and the public wage scale for health workers by different categories (Table 7). While this data can be found from national sources (primarily the Ministry of Health), the WHO Global Health Expenditure Database[12] also provides regional as well as some country level and internationally comparable data to be used in the costing of health care services.

The total cost would the sum of the annual wages and salaries to be paid for recruitment of the additional doctors, midwives and nurses required to meet the minimum threshold (DMN) and the annual wages and salaries to be paid for recruitment of the additional health workers in the other cadres (HWOC) as determined by the country specific fixed ratio. The total wage and salary costs would be:

$$\begin{gathered} \textit{Total Wage and Salary Costs for Additional Health Workers} = \\ (DMN_{category}\ x\ \textit{Target Annual Salary}_{category}) + HWOC\ x\ \textit{Target Annual Salary}_{average} \end{gathered} \qquad (12)$$

Annual target salary per health worker by the different categories would be based on comparing the starting levels in the country to average pay levels for tertiary or upper secondary educated workers, or to GDP per capita as in the case of education explained above. Ilkkaracan and Kim (2019) in their costing of the health care coverage gap in 45 high- and upper middle-income countries have found that the average pay for health worker was already at reasonable levels on par with average wage levels of higher educated workers (p.28) and hence used existing wage levels as the target levels.

Finally, we need the overhead expenditures, which can be identified on the basis of overhead expenditures per health worker. This can be identified like in the case of education, by taking the difference of the total public expenditures on health and the public expenditures allocated to wage and salary payments to health workers.

$$\begin{gathered} \textit{Total Overhead Expenditures} = \\ \frac{\textit{Existing Overhead Expenditures}}{\textit{Total no of Health Workers}}\ x\ \textit{No. of Additional Health Workers} \end{gathered} \qquad (13)$$

Existing overhead Expenditures (non-wage/salary health expenditures) =
Existing total health expenditures – existing wage/salary payments to health personnel

Total costs would be the sum of these two components:

$$\begin{gathered} \textit{Cost of the Health Care Coverage Gap} = \\ \textit{Total Wage and Salary Costs for Additional Health Workers} \\ + \textit{Total Overhead Expenditures for Additional Health Workers} \end{gathered} \qquad (14)$$

[12] http://apps.who.int/nha/database/Select/Indicators/en

Table 7 - Data Requirements for assessing the Care Coverage Gaps and Costing in Healthcare

Data	Disaggregation by	Source
Population		National Statistics Agency, Population Statistics
Health sector employment data	By Primary Cadres (Doctors/Midwives/Nurses) and other cadres (health professionals other than Doctors/Midwives/Nurses)	Ministry of Health WHO Global Health Expenditure Database Unions of Health workers Field surveys and research reports
Health professionals' wages and salaries		
Average/median wages/salaries of tertiary educated workers		
GDP per capita		National Account Statistics
Expenditures on health	By staff wage/salary expenditures versus non-wage/salary expenditures	Ministry of Health Budget WHO Global Health Expenditure Database

V.B. Long Term Care

Long-term or rehabilitative care (LTC) to older persons or people with disabilities entails a large variety of services, ranging from assistance with basic daily living activities, such as eating, bathing, dressing, mobility in or outside of the house, to support with basic healthcare ranging from medication, health monitoring, doctor's visits, pain management and wound dressing. A wider definition of LTC also entails supporting these direct care activities with secondary indirect care services such as shopping, cooking, cleaning and other necessary housework (Ilkkaracan and Kim 2019, p.33).

Provisioning of these LTC services take place in different organizational settings such as professional care services in an institutional setting (residential nursing homes or day centres) or a home-based setting, paid care services by domestic workers at home and unpaid care services by family and friends (Lipszyc, et.al. 2012; Gardiner and Hussein 2015). In the discussion below, formal professional care provisioning –whether in an institutional or in a home-based setting- constitutes the reference point for assessing and costing of the coverage gaps in LTC services. Note that many countries also provide cash benefits to households with dependents in need of LTC, which can be used to pay for care provided by domestic workers or function as some form of compensation for services by family and friends providing LTC to household members. The assessment of LTC coverage gaps does not entail cash transfers.

V.B.1. Care Coverage Gaps in LTC

In defining LTC coverage, there are two possible reference populations: population aged 65 and above (from here onwards 65+ population) or 'dependent' population, where 'dependency' is defined as 'limitation in activities because of health problems' (Lipszyc, et.al. 2012, p.24). The share of dependent population increases by age group. In EU countries, for example, the share of dependent people in the population less than 30 years old is in the 1 to 3 per cent range for most countries; for population 65-69 years old, it ranges from 6.5 per cent at the lowest and 24.1 per cent at the highest, and for the 85+ population it ranges from 20.3 per cent to 63 per cent (Lipszyc, et.al. 2012, p.71). Since regularly updated data on the size of 65+ population is readily available unlike data on dependency,[13] the former is more commonly used as the reference population if determining LTC coverage.

Similar to the case of ECCE services under education, there are no internationally agreed upon specific policy targets on LTC in terms of coverage rates. In identifying a target LTC coverage rate, Ilkkaracan and Kim (2019) and ILO (2018) adopt an approach similar to the one in ECCE and take the high-performing countries as a point of reference. High-performance is defined following a comprehensive study on LTC by Scheil-Adlung (2015) where countries are categorized in terms of

[13] Dependency data is available in the EU and most OECD countries, which conduct periodic Survey on Income and Living Conditions (SILC).

legislation with respect to full legal access to LTC support in the form of services or cash benefits. There are nine OECD countries that have such legislation on entitlement to universal coverage (Belgium, Czech Republic, Denmark, Germany, Iceland, Japan, Luxembourg, South Korea, and Sweden; Scheil-Adlung 2015, p.15). The LTC coverage rate of the 65+ population in these nine countries range from 6.9 per cent (S. Korea) and 8.8 per cent (Belgium) at the lowest to 15.1 per cent (Japan) and 15.5 per cent (Denmark) at the highest (Ilkkaracan and Kim 2019, p.58). The population weighted average LTC coverage rate of all nine countries is 12.4 per cent. This can serve as a lower bound target LTC coverage rate.[14]

The data needs for assessment and costing of LTC coverage gaps are summarised in Table 8. The LTC coverage gap can be measured in terms of the additional number of care receivers to be covered to meet a target coverage rate (such as 12.4 per cent). This would be given by the difference between the 65+ population to be covered to meet the target policy rate and the current number of 65+ population who already are covered by services. Those already covered are the beneficiaries who are benefitting from institutional centre-based services (residential or day care) or home-based professional services.[15]

$$\begin{aligned} &\textit{LTC Coverage Gap (Additional LTC Beneficiaries)} = \\ &\textit{(65+ Population x Policy Target Coverage Rate (12.4\%))} \\ &- \textit{(Current 65+ Population who are already LTC Beneficiaries)} \end{aligned} \qquad (15)$$

The LTC coverage gap is also expressed as the number of additional LTC workers required to provide services to the additional LTC receivers to be covered. For this, we need a target LTC receiver-to-worker ratio. One reference target is identified by Scheil-Adlung (2015) based on the population weighted median values of formal LTC workers (full-time equivalent FTE) per 100 persons that are 65+ in 18 selected high-performing OECD countries in the Americas, Asia and the Pacific and Europe. These countries, which provide LTC through a variety of systems, are considered to provide an acceptable minimum of LTC services. Based on their average, the threshold is set at 4.2 full-time equivalent (FTE) formal LTC workers per 100 persons aged 65 and above. FTE care worker need is identified with respect to employment hours. From the service receiver end, depends on the number of hours of contact and some target contact time.

Since the OECD countries do not rate the availability of services as satisfactory, Scheil-Adlung (2015) notes that 4.2 workers per 100 people aged 65+ establishes a lower-bound threshold (Scheil-Adlung 2015, p.11). The staff ratios range from 0 workers (for many countries) to 17 workers in Norway at the highest.

$$\begin{aligned} &\textit{LTC Coverage Gap (Additional FTE LTC Workers)} = \\ &\textit{(65+ Population in 100s) x (Target 65+ Population-to-LTC Worker Ratio (4.2))} \\ &- \textit{(Current Employment of LTC Workers)} \end{aligned} \qquad (16)$$

Note that the combination of the two policy targets discussed above, namely 12.4 per cent of the 65+ population as potential beneficiaries of LTC and 4.2 LTC workers per 100 65+ population, yields a LTC beneficiary-to-worker ratio of approximately 3:1. In short, if the number of dependent population is known, it is also possible to assess the required number of LTC workers by dividing the dependent population by 3 and taking its difference to the current employment of LTC workers.

V.B.2. Costing of Care Coverage Gaps in LTC

The cost of closing the LTC coverage gaps can be estimated in terms of two measures: The additional no of 65+ population to be covered by LTC services in order to close the coverage gap (additional LTC beneficiaries) and the required (adjusted)

[14] This policy target of approximately 12 per cent LTC coverage rate is associated with a universal right/access to LTC services by anyone with LTC needs in the 65+ population. It is derived on the basis of LTC coverage rates of countries where access to LTC is secured as a legal right. Assuming similar shares of 65+ population with LTC needs across different countries, we predict universal coverage adjusts endogenously to around 12 per cent if the population above 65 is relatively small.

[15] It is debatable whether to include those who receive disability cash benefits in already covered. The approach adopted by this policy tool defines care coverage by access to formal services. Accordingly, receivers of cash benefits can be considered as a potential target for included amongst those who are covered.

expenditure per beneficiary, or the additional LTC workers required to close the coverage gap and the target annual salary per LTC worker plus any overhead expenditures. Using the first measure, the cost of the LTC coverage gap could be stated as follows:

$$\textit{Cost of LTC Coverage Gap} = \textit{(Adjusted Cost per LTC Beneficiary) x (Additional LTC Beneficiaries)} \quad (17)$$

where

$$\textit{Adjusted Cost per LTC Beneficiary} = \frac{\textit{Total Public Expenditures (+ wage adjustment)}}{\textit{No. of Existing LTC Beneficiaries}} \quad (18)$$

The wage adjustment aims to reflect the improved target salaries for LTC workers, who on average receive very low wages, including the LTC workers in the high-income countries. For example, 50 per cent of the average wage in the USA, 14 per cent above the minimum wage in the UK, between 50 per cent and 75 per cent of the average national wages in the OECD countries (European Commission 2012, Active Ageing, Special Eurobarometer, No.378; Scheil-Adlung 2015, p.21-22). Skilled LTC workers are better paid and receive about average wages. Based on the addition LTC workers required, the cost of the LTC coverage gap would be

$$\textit{Cost of LTC Coverage Gap} = \textit{Additional FTE LTC Workers required x Target Annual Salary FTE LTC Worker} + \textit{(any overhead costs?)} \quad (19)$$

where the target annual salary for FTE LTC worker can be set in reference to the average national wages. Ilkkaracan and Kim (2019) use the wage gap between LTC workers and nurses as the reference and adjust LTC worker wages upwards by reducing the gap by half. Country specific wage targets can be set by comparing and adjusting LTC worker wages with statutory wages or average wages of workers with comparable job description or skills set.

Equation (20) includes overhead expenditures with a question mark. This is because wage payments constitute a large share of LTC costs and in most cases overhead expenditures are low, particularly in the case of home-based formal services. Nevertheless, in case of an expansion of services based on institutional settings (such as day care centres), overhead expenditures would need to be taken into consideration. The overhead expenditures per LTC beneficiary or worker can be derived on the basis of public expenditures and share of wage payments therein if data is available. If not, institutional accounts or field surveys may serve as source of data (Table 8).

▶ Table 8. Data Requirements for assessing the LTC Coverage Gaps and Costing

Data	Disaggregation by	Source
65+ Population		National Statistics Agency, Population Statistics
Existing number of LTC beneficiaries	Beneficiaries by access to services vs. cash transfers	Ministry of Health Ministry of Social Policies/Family International Health statistics databases such as WHO, OECD Unions of LTC workers Field surveys and research reports
LTC employment		
LTC Expenditures		
Average/median wages/salaries in the labour market	By education level By profession (domestic workers, care workers, health workers/nurses)	Household Labour Force Surveys
Statutory wages		Ministry of Labour

VI. Assessing Economic Returns

Having identified the coverage gaps in care services and estimated the required magnitude of public expenditures to close these gaps, we are ready to move onto assessing the economic returns to an equivalent allocation from public budgets. The various demand- and supply-side channels through which investments in the care economy produce outcomes were discussed in Section II (summarised in Figure 3). While both the short-run demand-side outcomes and the longer-run supply-side outcomes are equally important for a comprehensive assessment of returns to investing in care, as already explained in Section II, this policy tool focuses on the short-run, demand-side outcomes in particular.

Let us reiterate how investing in care activates a demand-side mechanism: Increasing spending for an expansion of care services affects demand for labour both in the care sectors and the other related sectors and increases employment. New employment generates new labour earnings and stimulates aggregate demand and demand-led growth. It also has important distributional outcomes by gender and household income depending on who the new job recipients are, how simultaneous access to jobs and services impact paid and unpaid work time, and the cumulative outcomes for households below the poverty line. The applied studies on investing in care reviewed in Section II take these short-run demand side outcomes as their measures of economic returns to investing in care.

The focus on this short-run demand-side chain of outcomes is primarily because employment creation, poverty reduction and gender equality are priority policy objectives. It also allows for a closer critical evaluation of public budget allocation decisions, which are undertaken on an annual basis, and the election cycles lead policy makers to put more emphasis on returns in the shorter-run. Moreover, the focus on the short-run demand side effects has become even more urgent in the context of the current Covid-19 pandemic and the associated economic crisis. One of the common policy actions by governments around the world entail stimulus packages to recover economic growth and protect employment. In many cases, these entail the necessary short-run protective measures to support the vulnerable sectors and workplaces (small- and medium scale enterprises), the unemployed, self-employed or low-income households. This policy tool aims to emphasize another important target for stimulus spending: expansion of care services which promise immediate returns in the form of new jobs, enhanced labour earnings, reduced poverty, inclusive, gender-equitable and sustainable growth.

The rest of this section presents a discussion of the assessment of the following short-run demand-side economic returns:

- Employment creation (by Sector and Occupation)
  - Directly in care services sectors
  - Indirectly in related sectors through backward linkages and induced effects
  - Distributional effects of employment creation and poverty reduction
  - Distribution of new jobs and labour earnings by gender, education, age, household income, poverty status and labour market status (unemployed, homemaker, student, etc.)
  - Gender employment gap, gender wage gap, gender jobs segregation, gender gaps in paid and unpaid work
  - Income poverty, time poverty, time- and income poverty
- Economic growth and other macroeconomic outcomes (productivity, budget and trade deficits, public debt)
- Tax revenue returns (self-financing potential over the short-run)

The assessments of different types of returns require different methodologies and data. The matching between the types of return to be assesses, methodology to be used and data requirements can be seen in Table 9. The discussion in this section elaborates on some of the methodological issues and the different tools that can be used to assess different types of economic returns. For example, a static IO analysis is appropriate for estimation of the magnitude employment creation, while macro modelling is better for the purpose of forecasting the likely changes in macroeconomic variables such as economic growth, public debt or trade balance, which are not taken into account in the IO analysis.

VI.A. Employment Creation

Public investment will create jobs directly in the activities in the care services sectors where the investment takes place (for example, new jobs in ECCE or LTC services). This is called *the direct employment* creation effect. It will also create jobs in other sectors through the transactions between the care sectors and the other sectors. As one sector of the economy experiences an increase in demand for its own output, it ends up demanding more goods and services from several other industries. In other words, there are multiplier effects on other sectors in the industries that supply necessary intermediate inputs (raw materials and services) to the care sector. This is called indirect employment creation through backward linkages across sectors.

There is also an employment creation effect through increased household spending due to higher labour earnings of newly employed. This change in household spending induces additional employment in the various sectors through new consumption. This is called the induced employment creation effect.

The assessment of total employment outcome entails an estimation of the direct, indirect and induced employment components:

$$T.E. = D.E. + I.D.E. + I.E. \qquad (20)$$

T.E. = Total employment creation (no of new jobs)
D.E. Direct employment (new jobs in the care sectors created as a direct result of increased spending on care services expansion, both care workers and non-care workers employed in the care sectors)
I.D.E. = Indirect employment (new jobs in other sectors created through backward linkages)
I.E. = Induced employment (new jobs in the care or other sectors created through increased household spending due to new labour earnings by newly employed workers)[16]

The direct employment created in the care sectors comprise both of care workers (such as teachers, teacher assistants, doctors, nurses, care workers for the elderly) and non-care workers (support staff such as administrators, cleaners, security) employed in the care sectors. In the case of care workers, the target service provider-to-beneficiary ratios are defined in relevant legislation or international criteria. For example, the maximum number of children per ECCE teacher is usually defined in national legislation on ECCE. Or the desired (minimum) number of health workers per population is defined by WHO as discussed in Section V.A. In the case of non-care workers, new employment creation can be calculated using the care-to-non-care worker ratios prevalent in the care sectors in the country. See the discussion in Ilkkaracan, Kim and Kaya (2015, p.39) as an example for the calculation of total direct employment for ECCE in terms of care workers (teachers and teacher assistants) and non-care workers employed in the ECCE sector.

The direct employment creation is derived from the information already entailed in the assessment of care coverage gaps and costing discussed in Section III. The care coverage gap (CCG) in equation (1) provides the additional number of service beneficiaries to be covered by services. This is divided by the target service beneficiary to service provider ratio (t.s.r) in equation (2) to determine the necessary number of additional service providers to close the CCG:

$$No\ of\ additional\ service\ providers\ to\ close\ the\ CCG = CCG/t.s.r. \qquad (21)$$

The care coverage quality gap (CCQG) in equation (2) is already measured in terms of the number of additional service providers necessary to achieve the t.s.r. Hence the total number of care workers through direct employment creation (D.E.cw) will be given by the sum of the two:

$$No\ of\ additional\ service\ providers\ to\ close\ the\ CCG + CCQG \qquad (22)$$

[16] The inclusion of the induced employment effect in estimations is debatable. The induced effects may create an overestimation bias depending on the spending multipliers of the different types of households, which receive the new jobs. Hence, it is a judgment call whether to include the induced effects in estimation of total employment creation (see Ilkkaracan, Kim and Kaya 2015 for a discussion).

The other two components of employment creation (indirect employment and induced employment) is estimated through an input-output (IO) analysis. The IO table is a square data matrix, which shows the linkages across sectors in terms of their input purchases and receipts of income from one another. Once the costing of the care coverage gap is undertaken, the corresponding expenditures are "injected" into the care services sectors in order to estimate the corresponding increase in the output of all other related sectors. This method captures multiplier effects through linkages of output growth between industries. Combining the sectoral output data with the corresponding sectoral employment data, it is also possible to estimate the employment multipliers for each sector. In other words, IO analysis shows when the output of a particular sector (i.e. the care services sectors) increases by a certain amount (by the cost of closing the care coverage gap), how much output and employment of all other related sectors increase.[17] In a similar vein, the induced employment creation is also derived through IO analysis as the IO table also shows the linkages between household consumption spending and the various sectors of the economy

Note that it is also possible to estimate direct employment creation in the care sector itself using IO analysis as well. An injection of increased expenditures into a particular care sector yields the corresponding increase in sectoral employment on the basis of its prevailing employment multiplier. This means, however, that we cannot control for the quality of employment or services because the own employment multiplier of the care sector is determined by the prevailing ratios of service beneficiary-to-provider, and also by the observed wage levels. Instead, we can make adjustments in the assessment of the care coverage gap and its costing with respect to beneficiary-to-care worker ratios and the wages of workers employed in the care sectors. The number of direct jobs to be created in the care sector itself is calculated as explained above. The wage allocations (the wage share in total expenditures) is determined a priori as explained in sections III, IV and V. As a result, we do not take into account the own employment multiplier of the care sector. The IO analysis is used to determine only the indirect and/or the induced employment creation.

Another important note of caution pertains to the fact that most IO tables do not entail separate entries for ECCE and LTC. These sectors are included as part of the education and healthcare services sectors in the IO tables. However, the cost structure and labour intensity of the ECCE and LTC sectors are likely to differ than the overall education and health sectors. For example, ECCE is more labour-intensive than the overall education sector, and the same holds for LTC with respect to healthcare. Injecting an increase of ECCE spending into the overall education sector (or an increase in LTC spending into the overall health sector) is likely result in an underestimation of the employment creation effect, because education and health have lower employment multipliers than the ECCE and LTC sectors. Other than the labour input, the ECCE and LTC sectors are also likely to differ in terms of their overall cost structure. For example, the health services sector is likely to have higher expenditures on medical equipment and technology than LTC services. To overcome such aggregation bias, it is possible to use the synthetic sector approach, which entails integration of the ECCE or LTC sectors as a separate entity into the IO table. This requires data on the cost structure of the ECCE or the LTC sector (see Ilkkaracan, Kim and Kaya 2015, p.37-39; p.68; Appendix II, and also Kim 2011 for a detailed discussion).

A comparative framework to other lines of spending

Many of the applied studies discussed in Section II, use a comparative framework whereby they compare the economic returns to increasing public expenditures on the care services sector to economic returns to spending of similar magnitude on other budget items, primarily physical infrastructure and construction sector, also other items such as green energy or cash transfers (Antonopoulos et.al. 2011; Ilkkaracan, Kim and Kaya 2015). Using such a comparative framework proves useful for different reasons. First, the policy implication can be interpreted not simply as a matter of increasing expenditures on care services, but determining public budget allocations for competing needs on the basis of acknowledged policy targets such as the potential to generate new jobs and decrease unemployment, decreasing

[17] The employment multiplier matrix is a vector of employment intensity by industry, which is the ratio of total number of workers to final output. This can be computed using IO output data and Household Labour Force Survey employment data disaggregated by industry. The employment multipliers are computed by industry to capture the number of jobs created in each industry to produce one additional unit of output. It captures the employment generation via inter-industry input supply and demand.

inequalities by gender and household income, poverty alleviation, short-run fiscal sustainability, and macro indicators such as GDP growth, productivity, budget and trade deficits.

Second, the adoption of a comparative framework also helps to compensate for a shortcoming of IO analysis: Namely, that it is a static analysis and does now allow for identification of possible dynamic changes that may be triggered by an increase in public expenditures; such as prices, wages, public budget deficits and interest rates which would all have implications for changes in output. IO models can be turned into dynamic ones, using a macro-model to capture macroeconomy wide effects (see below for a discussion). Nevertheless, a static application of the IO analysis is a practical and an appropriate tool for assessing the employment effects of industry-specific, ex-ante policy studies. This is particularly the case in a comparative framework, assessing the relative effects accruing from increased expenditures on care services versus another industry (such as construction). Since the dynamic changes triggered in public indebtedness, prices and wages are likely to be relatively similar independent of which sector the spending is allocated, we are able to compare solely the impact on job creation. The main objective of the IO analysis here is to compare the relative potential of one line of public spending over another in terms of macro level job creation and micro level distributional outcomes such as poverty reduction (discussed below).

Distribution of new employment by industry, occupation and gender

Using the macro IO method, the direct and indirect job creation can be classified primarily by industry. If we assume that the observed composition of employment in the different industries remain constant, it is also possible to identify the breakdown of the new jobs by other characteristics such as occupation and gender (also possible to apply a breakdown by education/skill levels). The gender distribution of the direct and indirect jobs in the different industries serves to achieve an important objective of this exercise with regards to assessing the gender disaggregated labour demand outcomes of different lines of spending. The occupational classification, on the other hand, is important as an input to the microsimulation analysis, whereby we allocate the various jobs to the employable individuals observed in the labour market. This is further discussed under distributional analysis below.

Table 9: Assessment of Economic Returns to Investing in Care: Methodologies and Data

Economic Returns: Assessment Measures	Methodology	Data
Jobs generation	Direct employment creation calculated based on care coverage gaps (CCG and CCQG) and target service beneficiary-to-provider ratios (t.s.r.)	CCG, CCQG, t.s.r., care worker-to-non-care worker ratio in care sectors
	Input-Output analysis for estimation of indirect and induced employment creation	IO data
Gender distribution of employment	Allocation of jobs by industry obtained from above using the gender ratios of current industrial employment	Household Labour Force Survey data (employment disaggregated by sector and gender)
Distribution of new employment and income by worker characteristics such as gender, education, age, household income, poverty status, region and labour market status (unemployed, homemaker, student)	Microsimulation and Regression analysis	Household Income (and Labour) Survey micro data
Poverty reduction	Calculation of new household income levels based on the microsimulation results and an assessment of the change in poverty status of household pre- and post-new employment	Household Income (and Labour) Survey micro data Poverty thresholds used by official statistics
Long-run growth and productivity	Applied macroeconomic modelling	Calibrated Macroeconomic Model for the country/region in question (Social Accounting Matrix- SAM)

Economic Returns: Assessment Measures	Methodology	Data
Tax revenue returns and short-run fiscal sustainability	Derivation of change in tax revenues on the basis of average wages and no of new jobs	No of new (direct and indirect) jobs Average annual salaries of newly employed workers Income and consumption tax rates

VI.B. Distributional Analysis and Impact on Poverty Reduction

The IO methodology enables a macro level distributional analysis in terms of the disaggregation of new employment by gender (or possibly by education/skill level). A more detailed distributional analysis is possible through applied micro-simulation modelling using household income survey data at the individual level (i.e. micro data).[18] Microsimulation modelling enables the allocation of the newly generated jobs are to particular individuals (non-employed but eligible for employment) observed in the dataset. Once the jobs are allocated, it becomes possible to estimate the labour earnings of the newly employed and the change in their household income. Hence it becomes possible to identify the associated change in income distribution and poverty rates.

A microsimulation approach developed by the Levy Economics Institute, applies statistical matching techniques to analyse such distributional issues. Table 10 provides an overview of the various steps involved (see Masterson 2018, 2013 and 2012 for applications to Ghana and Tanzania, Turkey, and Latin America; also Kum and Masterson 2010 for a detailed discussion).

First the existing pool of the available ('employable') labour is identified using the micro data from the household surveys. The 'employable' consists of the prime working age population, who are not in employment and also do not have any health or disability impediments. These are namely the unemployed (those actively seeking jobs), homemakers (predominantly female) and students (older than mandatory school age or post-university age).

In the second step, the new job openings are allocated to the employable individuals who are most likely to occupy them. This is done through a statistical matching procedure. For each individual in the employable pool (potential workers), we have information on their individual or household characteristics such as age, level of education, region of residence. We use regression analysis to estimate the likelihood of employment of each potential worker. On the jobs side, we already know from IO analysis, the distribution of jobs by industry and occupation. For each individual, the industry-occupation cells are ranked based on their highest propensity score. Finally using an iterative process, the individuals in the employable pool with the highest likelihood of employment are assigned the jobs with the highest propensity score.

Once the jobs are assigned, the labour earnings of the new job recipients can be estimated by regression analysis, using their demographic as well as job characteristics. The resulting household micro dataset, then enables the identification of impact of new job creation on distribution of income by household income groups, education/skills levels, gender (the gender wage gap) as well as estimation of impact on poverty.

It is also possible to estimate the impact on paid and unpaid work time. For this we need a dataset that entails both employment/income and time-use data. Conventionally the household labour/income surveys and time-use surveys are separate. It is, possible, however, to match these separate datasets using a statistical procedure. More specifically, the unpaid work time observed in the time-use survey micro data is integrated into the household labour/income survey micro data based on the similarity of individual and household characteristics that determine time-use patterns. Two recent applied studies, one on Ghana and Tanzania (Zacharias et.al. 2019), and the other on Turkey (Ilkkaracan, et.al. 2020) use such matched datasets. They estimate not only the demand-side outcome of job creation by increased social care spending, but also its supply-side outcome on changes of paid wok time (via employment into new jobs) and unpaid work

[18] Most countries have one or more of these household surveys: The Household Labour Force Survey, the Household Income (Budget) and Expenditures Survey, or The Survey of Income and Living Conditions.

time (via access to social care). Hence, they are able to assess the overall impact on poverty in a more comprehensive and gender-disaggregated manner by using combined time- and income-poverty measures.

Table 10: Overview of Microsimulation for Distributional Analysis

Step	Procedure
Define a pool of employable people	Identify non-employed but eligible for employment (working age, without disabilities or illness) including the unemployed and homemakers
Assign jobs	Estimate likelihood of being employed in each industry-occupation category for each employable individual; rank by likelihood of employment and assign the new jobs to employable individuals with the highest likelihood
Impute labour earnings and work hours	Predict wage earnings and work hours using a hot-decking procedure and regression analysis using information on individual and household demographic characteristics and industry and occupation of employment
Determine impact on household income and poverty status	Compare pre- and post-employment household income and change in total earnings by household income quintiles; and pre- vs. post-employment poverty rates
Determine impact on paid and unpaid work time, time- and income-poverty	Match household time-use data into household income data; estimate the change in paid and unpaid work time of newly employed individuals living in households with care-dependent household members

VI.C. Macro Modelling and Economic Growth

As already discussed above, while the IO analysis is a sound approach to obtaining reasonable estimates regarding the impact on employment particularly in a comparative framework, it does not allow for identification of impact on other macroeconomic variables, such as economic growth, productivity, budget and trade deficits or public debt, which may change as a result of the policy interventions.

Macro-models, however, allow for an estimation of such macroeconomic outcomes in a dynamic framework. Identification of impact on economic growth is of particular importance in the current context of the Covid-19, where almost all countries around the world face a deepening economic recession. Moreover, the estimation of some macroeconomic effects maybe important particularly in country contexts where the feasibility of fiscal policy interventions is constrained by fragile macro balances. Zacharias, et.al. (2019) note, for example, that in the context of simulating the employment and time impact of road improvements in Ghana and Tanzania, the policy intervention may require imported machinery and raw materials in addition to domestically produced inputs and labour. Hence this policy intervention to reduce commuting and unpaid work time may place demands on the foreign exchange reserves of the country and affect the exchange rate. This limits the policy space for a country with existing problems of external indebtedness and bound by agreements with international lenders. A full macroeconomic assessment provides information about such impacts.

Studies included in our overview in Section II (and the Appendix), focusing on demand-side effects of investing in care have used different macroeconomic models, namely:

- the Cambridge Alphametrics Macro-simulation Model (CAM) in Bargawi and Cozzi (2017): A non-equilibrium structuralist macroeconomic model for Europe to explore the effects of different types of fiscal policy (public spending) on employment generation, distribution by gender, growth, public budget deficit and debt.
- a competitive general equilibrium (CGE) model with a social accounting matrix (SAM) in Zacharias et.al. (2019): CGE-SAM provides a source of information, which is much more comprehensive than the IO table. The closure rules for the CGE model here follow a Keynesian framework, where employment is determined by demand (hence allows for unemployment) and the adjustment of savings to exogenous investment takes place through changes in output (rather than changes in savings rates) (see Zacharias et.al. 2019, pp: 61-64 for a discussion of the CGE-SAM model).

- a post-Keynesian feminist macroeconomic model in Oyvat and Onaran (2020): The model builds on prior work by Onaran, Oyvat and Fotopoulou (2019), extending it with an endogenous labour supply and wage bargaining model. Empirically, they use a structural vector autoregression (SVAR) analysis to estimate the impact of various policy interventions (an increase in social care spending, and also an increase in female wages closing the gender pay gap) on aggregate output and employment in the context of South Korea based on data provided by World Klems (2014) for the period from 1970- 2012.

Different macro models display different representations of the economy. The choice of macroeconomic model depends on a number of factors such as the model's theoretical underpinnings and assumptions, and hence its appropriateness to the analytical task at hand, the availability of data and calibrated models for that particular country/region, and the trade-offs involved in the time/costs of building sophisticated macroeconomic.

Regarding the theoretical underpinnings and assumptions, different models make specific assumptions about the behavior of the economy. These assumptions are based on the theoretical framework against which they are developed. There two broad macroeconomic theoretical frameworks: classical (mainstream) macroeconomics and non-mainstream (mainly Keynesian or structuralist) macroeconomics. The mainstream (classical) macroeconomic models make a number of binding assumptions, such as clearing markets under competitive free markets (for example the assumption of a clearing labour market and hence zero unemployment given a free labour market). By contrast, non-mainstream models, such as Keynesian or structuralist macroeconomic models, strongly question these (simplifying) assumptions and build models that adopt a more empirical approach to modelling. The three macro models listed above from the applied studies on investing in care, are examples of non-mainstream models.

These non-mainstream macro models are more appropriate for the task taken up in this policy tool: Namely, analysis of the economic impact of increased fiscal spending on care services expansion. Such a proposal itself rests on underlying assumptions regarding inability of free markets to create jobs on their own, and the need for public intervention in care provisioning, where care is seen as a merit good (or even a public good) with strong externalities. Hence an analysis of economic returns to investing in care is better reconciled within the framework of non-mainstream macroeconomic models.

The choice of macroeconomic models also depends in part on availability of existing models for a given country or region. Building a macroeconomic model from scratch is a time-consuming process that requires specific expertise and hence can be a costly undertaking. The Cambridge Alphametrics Model used in the Bargawi and Cozzi (2017) study on the EU countries, for example, is an existing model that has been calibrated for the EU economy.

By contrast, the CGE-SAM model used in Zacharias et.al. (2019) is a time-intensive and costly modelling option, which requires the use of multiple sources of data to build a Social Accounting Matrix (SAM). Yet it enables a detailed analysis of both distributional and macroeconomic outcomes. Zacharias et.al. (2019) used the existing SAM for Ghana (2013) and Tanzania (2017), and made some slight adjustments for their purposes (see p.50-51).

A SAM is a double-entry table, extended from an IO Table, that provides further detailed information about the economy. Its columns and rows record the transactions that take place between productive sectors, factors of production (capital and labor), institutions (households, firms and government), the capital account (the financial side of the macroeconomy) and the rest of the world (imports, exports and other financial flows) These accounts are symmetrically arranged (in rows and columns) forming a square matrix that traces the origin and destination of expenditures and income received.

In addition to providing a consistent framework of national accounts, a SAM incorporates the distributional and social dimensions of an economy. At an aggregate level, a SAM allows one to see how total income is distributed between capital and labour. At a disaggregated level, a lot more detail can be provided. For example, labour, a factor of production, can be specified as being male or female, skilled or unskilled; each industry can be described by the types and amounts of inputs used, including the female/male intensity of labour employed; or several household types to be constructed depending on socioeconomic characteristics, such as poor or non-poor households (Antonopoulos and Kim 2008, p.23-24). As such a SAM-based model allows for a great deal of sophisticated analysis, particularly in terms of income

distributional outcomes. Nevertheless, the costs involved (in terms of time and expertise) mean it may provide a practical choice only when there is already an existing appropriate SAM developed for that country or region.

VI.D. Tax Revenues and Fiscal Sustainability

The fiscal sustainability of an increase in public spending on care services is a primary question of interest. In the short-run, part of the expenditures would be self-financed through increased tax revenues that result from new job and income creation. This potential for self-financing in the short-run is especially important from a policy maker's perspective given the concerns that increased public investments require fiscal space, which is often constrained in many developing countries. Fiscal space has become even more of a binding constraint in the context of Covid-19, where many economies are observing negative growth and shrinking tax revenues simultaneously with pressures to increase public expenditures.

The self-financing potential depends on the change in tax revenues as a result of new jobs and newly generated labour earnings. There are two sources of the increase in tax revenues: Direct tax revenue from new labour income including social security contributions and indirect (sales) tax revenue from increased consumption spending. The tax returns can be estimated in the following three components:

- Income Tax (IT)
- Social Security Contributions (SSC)
- Consumption Tax (CT)

The necessary information for calculation of these three components of tax returns entail:

- income tax rate (t_i)
- social security contribution rate (ssc; both employee and employer contributions)
- consumption tax rate (t_c)
- average propensity to consume (c_p)

Using our estimations of new employment generated directly in the care sector (D.E.), indirectly in other sectors (I.D.E.) and induced employment (I.E.), plus the estimated salary rates of newly employed workers, we can derive the three components of tax returns. For simplification of notation, we sum I.D.E. and I.E. under total indirect employment (T.I.D.E.).

$$IT = (Average\ target\ annual\ salary\ per\ care\ sector\ employee \times t_i) \times D.E.) + (Average\ annual\ salary\ per\ employee\ in\ noncare\ sector \times t_i) \times T.I.D.E.) \quad (23)$$

$$SSC = (Average\ target\ annual\ salary\ per\ care\ sector\ employee \times ssc) \times D.E.) + (Average\ annual\ salary\ per\ employee\ in\ noncare\ sector \times ssc) \times T.I.D.E.) \quad (24)$$

$$CT = ((Average\ target\ annual\ salary\ per\ care\ sector\ employee \times D.E.) + (Average\ annual\ salary\ per\ employee\ in\ noncare\ sector \times I.D.E.)) \times c_p \times t_c) \quad (25)$$

$$Total\ Tax\ Returns\ (TTR) = IT + SSC + CT \quad (26)$$

The self-financing rate can then be expressed as a ratio of total tax returns to initial outlay of expenditures, i.e. the Total Cost in equation (4):

$$Self - finance\ ratio = TTR \div Total\ Costs \quad (27)$$

For a detailed discussion, also see de Henau, et.al. 2019, p.15-16 and Appendix II; and Ilkkaracan, Kim and Kaya 2015, p.56-58.

Other fiscal effects would also accrue in the short-run from reduced public spending on certain benefits and social expenditures (such as reduced public health expenditures, unemployment benefits, social transfers to poor households). There would also be effects on tax revenues in the long-run through various channels such as increased earnings due to enhanced human capital (in the case of increases in ECCE spending), improved labour supply and labour market attachment of women, increased labour productivity of workers with care responsibilities, and finally increased GDP growth and labour productivity. The applied studies reviewed in this policy tool commonly estimate the short-run changes in tax revenues due to new employment and income generation (i.e. short-run fiscal feasibility).

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