

Fair policies that can be immediately scaled up (expected BCR between 1 and 5)

Community Health Workers for Tuberculosis control: (BCR of 4.8).

Africa saw 417,000 dead from tuberculosis in 2016, causing 5% of all deaths. The policy proposes to four-fold increase the funding for Community Health Worker platforms, based on evidence from South Africa, one of the nations with the highest African TB rates. It estimates the total costs over 10 years at \$378m, but saving 44,000 lives. The costs include paying CHWs the national minimum wage, systematic ongoing training, dedicated supervision, computer-aided planning, patient monitoring and data analysis by team supervisors, mobile phones for both supervisors and the CHWs and the adequate refilling of job kits and airtime. In total, the social benefit is five-times the cost. The author estimates that BCRs will be similar for most other countries.

Treating childhood cancer: (BCR of 4.6).

About 170,000 children below 15 will get cancer in Africa in 2020. Half will not be diagnosed, and only about 10,000 will survive. If Africa had the diagnosis of the rich world with 97% diagnosed and 80% survive, it could save another 120,000 children next year. It would also signal that cancer is survivable and reduce stigma.

A comprehensive cancer care center, based on a study in Accra, Ghana, shows that the cost per child diagnosed is \$10,540 (regardless of type) and \$1,491 of indirect costs to families (travel, accommodation costs associated with seeking treatment; and lost work time of the parents). The social benefits per child is 4.6 times higher, because each child will increase its survival chances by 35% and live an extra 57 years.

The paper also suggests that higher BCRs (9-19) could be obtained if focus on treatment of five highly curable childhood cancers, which represent relatively low cost and feasible interventions (acute lymphoblastic leukemia, Burkitt lymphoma, nephroblastoma, non-Hodgkin lymphoma, and early stage retinoblastoma). However, costs are somewhat unrealistically low, given assumptions of zero

diagnosis costs, although these childhood cancers would be very rare, and no indirect family costs. If efficiency improves over time, it is also likely that the BCR could increase.

Urban access to basic water: (BCR of 4.5).

Water is crucial for life and health, and central to the promises of the SDGs. Basic water means an improved water source with collection time (including queuing) of no more than 30 minutes. Yet, Africa is trailing other regions in access, with only 84% of urban areas in Sub-Saharan Africa having at least basic water access.

Ensuring full access to basic drinking water for urban areas in Africa by 2030 will cost \$38.4bn or about \$3.5bn per year, with half being capital cost, the other half capital maintenance and annual operations cost. Yet, the benefits are much higher at \$175bn, meaning each dollar spent provides \$4.5 of social benefits.

Resilience to drought: (BCR of 3.6).

Responses to catastrophes often come late, cost more and help less. Since 1900, the Horn of Africa has experienced more than 18 famine periods.

The policy proposes an alternative to a late and ineffective response. Over a 15-year period it estimates the costs of establishing an early humanitarian response, a safety net for poor in areas affected by drought, and investment in resilience building household incomes. The costs are estimated for 15 million people across Kenya, Ethiopia and Somalia, but could likely be extrapolated to other chronically food insecure areas.

The total cost is \$2.9 billion, with more than 95% from household transfers. The benefits would run to \$10.3 billion, with half from avoided late and ineffective aid, almost all the rest from the actual benefits from transfers and from avoided income and livestock losses.

The benefit-cost ratio is likely somewhat underestimated, as it only includes benefits in drought situations.

SME training & credit: (BCR of 3.1).

African small- and medium-sized enterprises (SMEs) often have a hard time growing. The policy suggests more training and better credit support. It estimates the costs and benefits with a concrete example of a SME taking scrap metal and turning it into agricultural equipment like millers, threshers, ploughs, canning, steel and metal processing. Based on 5-year estimates from Ghana, Kenya and Malawi, the costs produce 3.1 times in social benefits.

Scale-up solar energy for unreliable urban grids: (BCR of 3).

Power-outages have huge costs in terms of lost production and sales, along with extra costs and pollution from diesel generators. Based on case studies from Ghana and Kenya, the policy proposes to install solar panels (PV) and battery storage to help increase reliability in unreliable, urban power grids. It will also include smart meters, charging ports, water dispensing facilities, charging points, solar coolers and solar pumps. In total the costs for an energy park increasing reliability for 8,000 people will cost about \$3m. The benefits sum to \$9m, with two-thirds from avoided power outage losses and improved power quality, about \$1m from environmental benefits of less pollution and CO₂, and half a million in avoided diesel costs. Each dollar spent will produce \$3 of social benefits.

Community Health Workers for Hypertension control: (BCR of 2.3)

Hypertension ranks among the main causes of mortality in sub-Saharan Africa (SSA). A principal contributor to cardiovascular disease, a costly and debilitating occurrence, in which many African households find themselves undertaking significant expenditures, in some cases considered catastrophic vis a vis their disposable income. The Pan-African Society of Cardiology (PASCAR) has identified the screening and treatment of hypertension as the first priority to reduce the burden of cardiovascular diseases in sub-Saharan Africa (SSA). Hypertension detection in Africa currently relies on opportunistic screening at health facilities. With the non-existence of

health facilities in remote/rural areas and the shortage of staff willing to go to those areas, task-shifting or task-delegation has been positioned as a practical solution for improving hypertension control. Thus, the benefits and costs associated with the scaling-up of the screening and treatment of hypertension using community health workers as active case-finders have been analyzed. Screening everyone, that is potentially hypertensive, reveals itself to be an expensive proposition, as prevalence rates in SSA average 46%. The model analyzed is active case detection by professional community health workers, which results in modest benefit-cost ratios of 4.3 in South Africa, Nigeria 2.1, and Kenya 2.3.

Graduation from ultra-poverty: (BCR of 1.9).

Tackling poverty is the first SDG and the priority area for the first goal of the African Union's Agenda 2063. Yet, globally there are still 736m people living in extreme poverty, half of whom live in Sub-Saharan Africa. One important way to address poverty is through the Graduation Model, which create self-employment with seed capital and a transfer of asset (usually livestock). It is supported by early cash stipends, financial inclusion, training and coaching to help protect the asset and maximize profitability of the micro-enterprise.

Based on randomized control trials in seven countries, we have good information about costs and benefits. Typically, the benefits are only measured in increased consumption. If this only last for a year, the policy is not worthwhile, but as studies show It is likely to persist for many years and some up to 14 years, the average benefit discounted over 15 years outweigh the costs by \$1.89 for every dollar invested. Some studies indicate that there are also other benefits like reduced stunting, which could make the BCR somewhat higher.

Improved sanitation: (BCR of 1.6).

Lack of sanitation leads to more disease and death, yet only 30% of Sub-Saharan Africa had access to basic or safe sanitation in 2017. The brief estimates the effectiveness of rolling out Community-Led Total Sanitation (CLTS) to an average African population. The program is not

just about teaching people about the health benefits, but about CLTS facilitators conducting community participatory exercises that aim to “trigger” behavioral change, engendering shame and disgust among village residents who engage in open defecation.

The costs are program delivery, latrine construction, and the time households spend participating. If everyone in a village of 500 people participates, the total cost is \$8,365. Two-thirds of this cost comes from the CLTS program and the time spent participating, with a third costs to latrine construction and maintenance.

The benefit is more than three times as high, with almost half the benefits from avoided death, 30% from avoided disease and 20% from less time spent having to walk to an open defecation site.

However, not all villages will participate fully, with the low-uptake villages still incurring all the program costs and some of the latrine costs but achieving only a small fraction of the benefits, leading to poor return of 60¢ on the dollar.

Using data to estimate the relative proportion of low- medium and high-uptake villages, the brief estimate that on average, the costs run to \$6,600 per village, and delivers social benefits 1.6 times that.

High speed train network: (BCR of 0.9-1.5).

Investment in transport is viewed as a way of boosting economic growth, linking cities, accelerating urbanization and strengthening regional integration. With Africa land total area of about 30.37 million km², the vast distance between North and South as well East and West, makes movement of cargo and passenger even more difficult.

The AIHSRN is expected to connect 54 countries, the study only provides the case for only 10 countries where 44 links estimated at 42,657 km are identified and are projected to meet a freight demand of between 156,325 - 225,637 million tonnes per year between 2020 and 2063. The project is expected to be constructed between 2020- 2024 and has a lifespan of 50 years. The capital cost for the

subset included in this study is \$878 billion, more than a third of the combined African GDP. This is before any cost increases, which accompany many large infrastructure projects. In addition, the annual recurring costs are estimated at \$2.4 billion.

The value of time savings, reliability and reduced road traffic injuries have all been estimated, but are dwarfed by the benefits from increased trade and economic contribution of the high-speed rail industry following the investment. Together these two factors make up 97-98% of the total benefits.

For policy decisions, it is important to take considerations of the country specific CBRs and also the link/track specific CBRs. Among the links/tracks with the highest CBR are in Nigeria and South Africa at 5.5-8.8 and 2.8-4.5 respectively. Subsequently several risks factors such as capital costs, construction costs, and operating costs, traffic demand, economic growth level, value of time and discount rates are critical for investment decisions. Mozambique is among the countries with links that have the lowest CBR of about 0.03 to 0.06

Poor policies that can be immediately scaled up (expected BCR between 1 and 5)

Off-grid rural electrification: (BCR of 0.3-0.9)

“Off-grid rural electrification” reminds most of us about bringing solar lanterns to rural communities who otherwise use kerosene for lighting. The menu of technological options is, however, much broader than solar lanterns, including mini-grids, energy kiosks, and individual systems.

Past studies have listed a range of benefits associated with electrification, these benefits include education, health, safety, income, economic development, and time-savings. Recent studies, however, provide conflicting evidence on the realized impacts. Studies in Kenya report no impact, while other studies report significant impact in South Africa, Kenya, Mozambique, Rwanda, Tanzania, and Uganda. However, the internalized portion of the benefits can be captured by Willingness to Pay (WTP) studies.

The investment costs for solar home systems range from 13 to 182 USD for 0.5 Watt, a 3.3 Watt, and a 20 Watt device. However, the willingness to pay is significantly lower, between 38% and 55% of the price of each device, or about 70 cents to 1.05 USD per month and household. But this consumer-based estimate is unlikely to incorporate longer term educational and health benefits.

Studies in Rwanda, Burkina Faso, and Indonesia show report that access to electricity has no impact on the total number of hours studied. A recent evaluation report in El Salvador (2017 MCC), however, reports the health impacts of electrification due to improved home air quality. This study uses the relative risk published by 2017 MCC for cardiovascular disease and lung cancer, along with the Disability-Adjusted Life Years estimated reported by 2018 Lancet and the value of statistical life reported by 2017 Viscuzi to calculate the value of health benefits. The value of DALYs averted per household per month in Sub-Saharan Africa is 2.05 USD.

In total the revealed benefits and health benefits do not exceed the cost of serving this demand using micro-grids, which is 3.45 to 9.44

USD per month. Resulting in every dollar invested in off-grid rural electrification using the studied technologies only generates 30 to 90 cents worth of benefits.