



CRUCIAL MEASURES TO IMPROVE HEALTH IN UGANDA



EXECUTIVE SUMMARY

The present policy brief builds on 11 systematic reviews and one investigator-blind randomized controlled trial to address the Burden of Disease of Uganda and understand the principal risk factors causing major problems on the delivery of health care, mostly in villages far located from the health facilities. This policy brief identifies in a first step, the structure of the health care system of Uganda, its characteristics, and most important facts, to then continue with the analysis of salient aspects of the Burden of Disease. The findings in this area indicate a double burden of disease, ranging from communicable diseases such as Malaria, HIV/AIDS and neonatal disorders, to non-communicable disease such as stroke, ischemic heart diseases and congenital defects. Therefore, the recommendations focus on 1) Promoting vaccination campaigns for BCG and MDA 2) Enhancing task-shifting not only for ART in the treatment of HIV/AIDS but also in NCDs such as ischemic heart diseases and cardiovascular risk factors 3) Introducing Micro nutrient supplementation and probiotic supplementation for the health of mothers and babies 4) Subsidizing and delivering knowledge of usage of bed nets 5) Delivering sexual education in schools to prevent HIV/AIDS transmission 6) Implementing tobacco taxes and framework on low sodium and 7) Developing a package of care for everyone, specially children.

Figure 1: (International Medical Aid 2016)



UGANDAS HEALTHCARE SYSTEM

Uganda's health care system ranks according to the Legatum Prosperity Index (LPI) at number 127 from all countries worldwide (The Legatum Institute 2021) *. Although within the regional context Uganda has achieved much better results, it has various challenges not only within the healthcare system, but within political turmoil in the aftermath of the post-colonial period. These challenges make the country a fragile state. Around the 1980s and 1990s the adult HIV prevalence reached skyrocketing epidemic levels with a total prevalence of 9.6% (UNAIDS 2020). As well as 39 deaths per 1000 childbirths (UNAIDS 2020). It was until 1994 where the government implemented a healthcare reform. This reform foreshadowed a decentralized mechanism, which gave the sway of health provision to the private sector and non-governmental organizations. (Yates et al. 2006) The reform targeted on the one hand, the demand side, where the President decided to abolish the user fees in all units, except private wings, which reduced the costs for patients (not including transportation, time and commodities) and on the other hand, the supply side, where the reform attempted to improve service coverage. (Yates et al. 2006). Still, even after the reform the healthcare sector is not yet entirely accessible. Major challenges remain such as, the fixed funding of hospitals which has prevent to increase the personal in hospitals and increase the supply of drugs and equipment. Additionally, inequity in provisions of health services has been increasing along with economic differentials, where the poverty rate at \$3.2 a day reaches 70,5% (Knoema, 2018).

The current system's structure (figure 2) foresees a decentralized mechanism with national and district levels. At the national level national hospitals, regional referral hospitals and semi-autonomous institutions including Transfusion services are found. The district level consists of village health team or level 1 health services, which are community health workers who not only deliver curative services, but also health education programs and preventive services (Serelus 2021). The next level Health Center II is a patient service commanded by nurses (. Level Health Center III serves 10,000 people and delivers HC II services as well as in patient, simple diagnostic, and maternal health services. HC III is commanded by the clinical officer. HC IV above, is commanded by a medical doctor, which provides surgical services and obstetric care (Serelus, 2021).

Recently, Uganda has been facing an Ebola outbreak originating from South Sudan., whereby institutional flaws and the fragility of the health care system are being tested (WHO 2022). Therefore, this policy brief aims to identify and formulate evidence-based recommendations to encourage access to equal health as foundation of human rights protection.

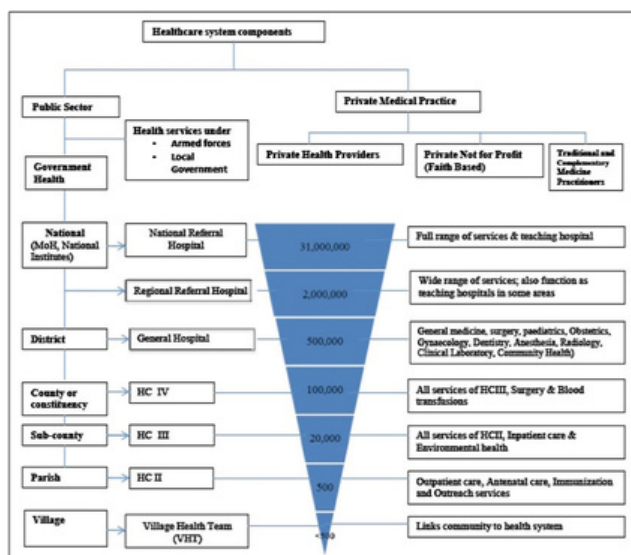


Figure 2: Uganda's health care structure (ResearchGate 2016)

Ugandas health care has despite the circumstances achieved to:

- decrease HIV/AIDS prevalence from 9.6 in 1990 to 5.2 in 2021
- decrease the maternal mortality ratio from 578 per 100,000 live births in 2000 to 375 per 100,000 livebirths in 2017.
- Increase the life expectancy from 44 to 64 years between 1960 and 2020.

Health facilities: 6,937

- 45.16% (3,133) - Government owned
- 14.44% (1,002) Private and Non For Profit
- 40,29% (2,795) Private For Profit
- 0.10% community owned

(Ministry of Health/Government of Uganda 2022)

Healthcare service coverage:

- 0.5 pro 1000 persons in 2010 (Uganda Krankenhausbetten, knoema 2022)
- in 2016 the number of births attended by skilled health personnel was 74,2%. (Uganda Geburten betreut durch qualifiziertes Gesundheitspersonal, Knoema 2022)
- Immunization completion rate for measles 2017/2018 was 86% (WHO Africa, 2018)
- Immunization rates of Tetanus vaccine have grown from 71% to 79% (WHO Africa, 2018)
- **Human resources for health:**
- Density for nursing and midwifery personnel per 1000 population was 1.2 number in 2018 (Knoema, 2015)
- Density of pharmaceutical personnel was at 0 number per 1000 in 2015, unchanged since 2012 (knoema, 2015)



APPROACHES AND RESULTS

Based on the Global burden of disease, this policy brief examines the current situation in Uganda, as well as which factors are involved in the main causes of disease around the country. Moreover, the policy builds up on various systematic reviews, randomized controlled trials and academic studies, ensuring the health ministry of Uganda, up to date information on research regarding the alleviation of the main factors of risks of the population. The main sources of research were Google Scholar, Campell Collaboration, BMJ Open, research bank, Cochranellibrary and PubMed. By the end of the Policy the minister of health will encounter some policy recommendations on how to optimize the programs already implemented or well-funded evidence on the introduction of new programs and methods.

Burden of Disease

What causes the most deaths?

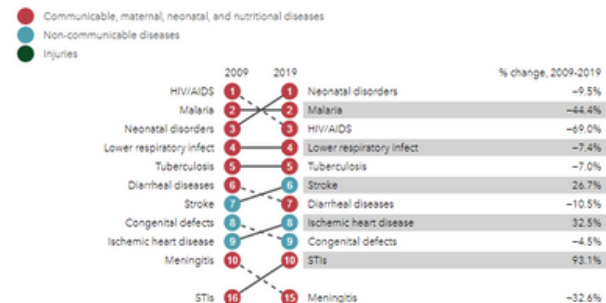


Figure 3: Uganda's Burden of Disease

Figure 3 describes which risks factors drive the mortality rates as well as which factors cause most disability combined. The top 10 risks include malnutrition, air pollution, unsafe sex, WaSH, alcohol use, high blood pressure, high fasting plasma glucose, high body-mass index, occupational risks, tobacco and intimate partner violence.

Figure 2 describes the Burden of Disease of Uganda in % change between 2009 and 2019. What drives the most deaths due to communicable diseases for all ages are: neonatal disorders, Malaria, HIV/AIDS, Lower respiratory infect, tuberculosis, diarrheal diseases, STIs and Meningitis. For non-communicable diseases the causes are mostly, stroke, ischemic heart disease and congenital defects. For all diseases the % change is negative except for ischemic heart disease.

What risk factors drive the most death and disability combined?

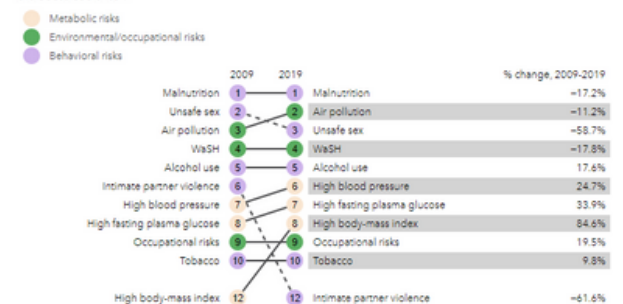


Figure 4: Uganda's Burden of Disease - Risk factors

How much is spent on health - now, and in the future - and from which sources?

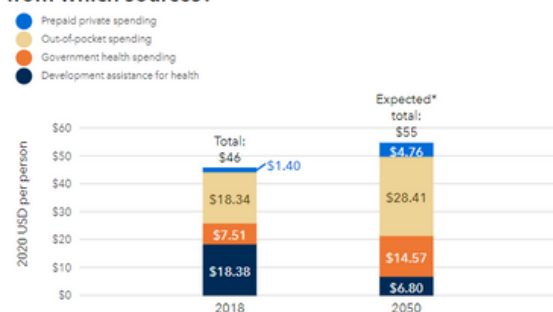


Figure 5: Uganda's expenditures on health

Figure 4 shows the expenses on health as of 2019 and the expected expenses in the future. As for 2019 most of the costs are shared between the individual and development assistance. The government contributes with 16.32% of the total costs. For 2050 the expected total foresees a reduction of the development assistance of \$11,58 and increase of the out-of-pocket spending of \$10,07.



COMMUNICABLE DISEASES

NEONATAL DISORDERS

- This systematic review assesses the effect of three neonatal nutritional interventions that have the potential of reducing mortality during infancy in low- and middle-income countries. These are synthetic vitamin A, dextrose and probiotic supplementation. Results showed no significant impact of vitamin A on infants at 1, 6 or 12 months of age. Nevertheless, neonatal vitamin A supplementation increased the incidence of bulging fontanelle by 53%. For probiotics, studies showed that the risk of death declined by 20% compared to controls. Also, a severe form of gastrointestinal illness in neonates was reduced by 54%. Compared to control, probiotic supplementation reduced the risk of blood infection by 22%. (Imdad et al. 2020)
 - LIMITATIONS: significant heterogeneity among subgroups for the outcome of neonatal sepsis. Also limited number of studies in the community context that addressed the effect of probiotics.
- In 2021 An investigator-blind randomized controlled trial found that trials done in infant with low birthweight in Entebbe, Uganda showed that BCG vaccination protects against non-tuberculous infections, in addition to having tuberculosis-specific effects. Furthermore, a prioritization of BCG on the first day of life might have significant public health benefits through reductions in mortality. This specially in high mortality settings. (Prentice et al. 2021)
 - LIMITATIONS: Modest participant number might not provide adequate power to detect differences in serious illness and death. Also, the follow-up time was short.

MALARIA

- A systematic review on Mass drug administration for malaria found that in moderate to high transmission settings, after the treatment with Mass Drug Administration within six months the prevalence of the main parasites found in Malaria was not important. In very low- to low transmission settings, the prevalence and incidence were reduced for up to three months for both the malaria transmission in humans and the human infection when an infected mosquito feeds on a human. (Shah et al. 2021)
 - LIMITATIONS: The authors classified out of the 13 studies, every single one of them in terms of high risk of bias or low risk of bias. Aspect rated as high risk of bias were: contamination protection, baseline imbalance, random sequence generation and allocation concealment.
- A systematic review on strategies to increase the ownership an use of insecticide-treated bed nets (ITNs) to prevent malaria showed that more than giving away ITNs for free, this should be combined with education in the appropriate use of ITNs. The review showed that this way the appropriate use can increase the number of people sleeping under ITNs. (Polec et al. 2015)
 - LIMITATIONS: Publication bias was not explored formally due to few studies and missing data.

HIV/AIDS

- A systematic review on Implementing HIV prevention in Sub-Saharan Africa of interventions targeting systems, communities and individuals found that the most successful programs across the 51 studies, bundled different interventions and integrated them into the health system. Four strategies in this area highlighted the uptake of HIV services to prevent mother-to-child transmission (see recommendations). These strategies showed positive results in indicators such as facility delivery, linkage to care, antenatal care visit completion, ART, infant and young child feeding uptake, survival and male partner involvement. Additionally, the integration of PrEP into routine family planning services found that adherence and incidence improved. Furthermore, they found that the integration of strategies tailored to the needs of the youth or Adolescent Girls and Young Women services were more likely to receive testing, contraception and condoms when compared to the standard. (Rapaport et al. 2022)
 - LIMITATIONS: The effectiveness of HIV prevention was taken into account in the local contexts, a generalization of programs might be of limited value, since in every region there are specific factors linked to each context. (Rapaport et al. 2022)
- Another systematic review found that school-based sex education is a cornerstone of HIV prevention for adolescents in low- and middle-income countries. The results of the meta-analysis demonstrated that students who receive school-based sex education not only have more knowledge on the topic, but also more self-efficacy related to rejecting sex or condom use, fewer sexual partners, and less initiation of first sex during follow-up. (Fonner et al. 2014)
 - LIMITATIONS: all outcomes were based on self-report, which creates bias and memory error. Also, outcomes combined in the meta-analysis are not identical which can lead to inaccuracies. (Fonner et al. 2014)



POLICY BRIEF

- Stigma is oftentimes a major contributor on the prevalence of HIV. It slows down or even stops the uptake of adherence to life-saving antiretroviral treatment (Pantelic et al. 2019). A systematic review made by Frontline Aids found not only that there is a robust under-representation of marginalized communities in self-stigma but also interventions that have so far worked, such as empowerment interventions, economic strengthening, and ART provision. In some contexts, even cognitive-behavioral therapy, for instance, introduction psychological support for women alongside with health education showed reduction in self-stigma. (See recommendations). (Pantelic et al. 2019)

◦ LIMITATIONS: some studies which did not include a component to address structural risks produced mixed effects.

Non- COMMUNICABLE DISEASES

Stroke

- A study made in southwestern Uganda revealed an overall 30-day stroke mortality of 38,1% (Olum et al. 2021) being one of the most common neurologic diagnoses with a prevalence of 14,3% (Diaz et al. 2020). A systematic review of economic evaluations on primary (prevention) and secondary (treatment) interventions for cardiovascular disease in low-income and middle-income countries found that the economic evaluations that were performed for pharmacological interventions focusing on blood pressure, cholesterol lowering, and antiplatelet aggregates proofed to be very cost-effective. Compared to individual interventions, the population interventions targeted mostly sodium reduction intake and tobacco control strategies, these were very cost-effective with many being cost saving. (Aminde et al. 2018)

◦ LIMITATIONS: search focused on articles in English and French, other literature might have been potentially missed

Ischemic heart disease

- The management of hypertension as a risk factor for stroke, ischemic heart disease and renal dysfunction is crucial for the prevention of these diseases. (Kokubo/Iwashima 2015). A systematic review of randomized controlled trials found that task-shifting interventions such as strategies like provision of medical prescription by nurses, community health workers, pharmacists and telephone follow-up for cardiovascular risk reduction in low-income and middle-income countries reported a significant blood pressure reduction, as well as, diabetes reduction. (Ogedegbe et al. 2014)

◦ LIMITATIONS: Of the 2771 articles identified only 3 met the authors criteria. This shows a small number of studies which to a certain degree were also heterogeneous in terms of the various CVDs, which did not allow for a meta-analysis. Cost-effectiveness was also not discussed.

- Another systematic review summarized interventions on the quality improvement for Cardiovascular Disease Care in Low- and Middle-Income countries. At the patient/provider level, team-based care led to better medication adherence (see recommendations) and hypertension control. At the system level, studies provided evidence that introduction of universal health insurance coverage ameliorates hypertension and diabetes control. (Lee et al. 2016)

◦ LIMITATIONS: Interventions and conditions were very diverse, reason why the authors were not able to summarize the effects in a meta-analysis. Most study durations were relative short (under 12 months)

Congenital defects

- A systematic review and meta-analysis on vitamin and mineral supplementation during pregnancy on maternal, birth, child health and development outcomes in LMC found that supplementation of MMN improved child serum/plasma retinol concentration and in the reduction of diarrhea incidence amongst children, which was not proved before. Furthermore, Multiple Micronutrient supplementation (MMN) showed a greater effect on low birthweight provided that the supplement had more than 4 micronutrients. This goes in line with other systematic review findings on the topic. For example, Cochrane review on MMN supplementation in pregnancy reported no negative impact of the intervention on neonatal mortality. Additionally, they proved that IFA and iron supplementation both improved maternal anemia and low birthweight (Oh et al. 2020).

◦ LIMITATIONS: the review did not examine data on the pregnant adolescent population. Birth outcomes were not disaggregated by sex, which was a limitation for conducting subgroup analyses by sex on infants.

- Congenital defects are one of the main causes of the global burden of disease and unfortunately low- and middle-income countries are disproportionately affected (WHO 2020). A systematic review on the economic analysis of Children's surgical care in low- and middle-income countries found that many areas of children's surgical care are very cost-effective in LMICs, this surgical care provides numerous societal benefits and are an appropriate target for investment. (Saxton et al. 2016)

◦ LIMITATIONS: Limitations in this review are inherent to economic analysis, including a range or assumptions. Besides, the quality of different surgical studies uses different methods that impact the cost-effectiveness of a procedure.



Policy recommendations

Neonatal disorders

The ministry of health is recommended to :

- Encourage the supplementation of neonatal probiotic for the prevention of high mortality rates mostly in preterm or low birth weight babies.
- Promote vaccination campaigns for BCG. For this to happen is crucial that the ministry of health attaches value on task-shifting. This way physicians can pass over these relatively simple duties to non-physician health workers.
- Enlarge the health care coverage by allowing the training of village health teams to act within the framework of the natural helper model of health promotion. Using the health advisors within the social network of the community, which are trusted and respected and recruit them to serve more formally might increase the cost-effectiveness of the overall coverage. It should be noted that the framework should be tailored specifically for each internal community. (Turinawe et al. 2015)



Figure 6: Health worker draws COVID-19 vaccine jab during the current vaccination exercise in Uganda. (WHO Uganda/Mwebembezi 2021)

Malaria

The ministry of health should in this regard not only:

- subsidize bed nets so that everyone has access to them, but also have village health teams to clarify the proper usage of the nets, and their correct preservation and care.
- . Also, it is recommended to the ministry to initiate vaccination campaigns for MDA. This with the aim of giving the population a full treatment of antimalarial medicine. Often is in repeated intervals. For this reason, a further recommendation would be to implement incentives in form of food or money that compensates for the time/ transportation costs. This method has been proven to lower the cost per immunization by increasing efficiency. (Banerjee et al. 2021, 64)

HIV

The ministry of health is advised to continue the national PMTCT framework albeit with further implementations, namely:

- insitutionalize HIV/PMTCT services in private not for profit to the private for profit health facilities.
- increase testing campaigns against HIV to have a more clear target for the primary intervention (condom use, harm reduction programmes like needle exchange, pre-exposure prophylaxis PrEP)
- Combine medical intervention of ART and counseling with a peer-mentorship from other people living with HIV.
- Introduce secondary prevention strategies such as voluntary male medical circumcision, post exposure prophylaxis and prevention in vertical tranmission mostly in breastfeeding
- demystify false information around HIV by raising awareness in the public as well as offer programmes that tackle partner violence and enhance healt-seeking behaviours.
- Offer the community with the help of task-shifting and village health teams anti-stigma sessions in which topics like self-esteem, human rights empowerment, nutrition support, saving schemes topics are addressed. (Pantelic et al. 2019)



Policy recommendations

Stroke

The ministry of health is advised to:

- In high-risk groups initiate monotherapy of diuretics in order to lower not only the high levels of blood pressure, but also the excess of sodium in the body.
- implement smoking control interventions such as complete smoking bans and increased taxation for tobacco.
- set a legal standard to reduce the content of salt in high sodium products.
- stock the villages with high prevalence of coronary syndrome or prone to strokes with clopidogrel and aspirins and initiate treatment as a bundle, since it showed to be more cost effective than aspirin alone. (Aminde et al. 2018)
- In patients with acute coronary syndromes introduce the intake of ticagrelor.



Figure 6: (African Population and Health Research Center 2020)

Ischemic heart disease

The ministry of health should in this area:

- enable continuous training and feedback from health professionals to village health workers, so that task shifting provides for them to prescribe medications for common coronary disorders such as ischemic heart disease and manage uncomplicated Cardiovascular risk factors. This has worked for HIV/AIDS epidemics and can potentially be used in NCDs.
- build awareness of acute CVD symptoms, the treatment and access to treatment by educating in schools and villages about NCDs.
- Increase the access to mobile telecommunications should also be a priority of the health ministry, since SMS through mobile phones can be used as a tool to improve CHF, hypertension and diabetes care outcomes. (Lee et al. 2016)

Congenital defects

In this area the ministry of health should:

- Enhance the distribution of multiple micronutrient (MMN) and vitamin supplementation to pregnant women, but mostly to the ones with scarce access to health facilities to promote maternal and fetal nutrition.
- promote additional to the MMN, IFA and iron supplementation, which both improve maternal anemia and low birthweight.
- understand surgical care as part of an investment in a package of care for the future of children born with congenital anomalies.
- facilitate geographicly transport to health facilities so that everyone can have access to these services
- define the costs and economic benefits for every village of introducing surgical care or more generally a package of care, in order to have an overview of the benefits for the long-term of the population of Uganda.



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