

# A study on the status of dental and oral health in Malawi and its implication in achieving global health goals

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## Abstract

Malawi is a resource-constrained African country with poor social and economic indicators especially those pertaining to the high burden of infectious diseases. In the advent of the global coalition to achieve Sustainable Development Goals (SDGs) there has been global call to align funding of infectious diseases and non-communicable diseases (NCDs) which were originally excluded from the SDGs and resulted in poor donor response, especially to countries that need it like Malawi. The country is documented to have a burden of NCDs of up to 38%. We conducted a study on the status of oral and dental health of the country through search of publications in the discipline citing Malawi, cognisant that it is such research evidence that could aid the country with steps for deriving the right policies and practices. Our search showed paucity of publications but those that were found (N=9) highlight the importance of dental and oral health care for all Malawians as an important challenge, especially for vulnerable groups like pregnant women and children. We argue that in order for Malawi to fully address SDG3 which targets achieving Good Health and Well-Being for all there should be increased effort for adoption of newer technologies and conduct of relevant research studies in dental and oral health. An example of newer technologies includes the shift in dental material design from bioinert to bioactive ones in order to regulate the biological response of biomineralized tissue. The designed research agenda should be informative and broad enough to include interventional studies, such as, clinical trials, social science studies and economic analyses.

## Introduction

Malawi is a low-income African country with unsatisfactory social and economic indicators. The World Bank calculated the Gross Domestic Product (GDP) of the country to be 1,038 US Dollars in 2019 (<https://data.worldbank.org/country/malawi>). The country's burden of communicable diseases and diseases due to poor hygiene is among the highest in Africa. In 2010 the Malawi Demographic and Health Survey [1] indicated that the infant mortality rate between 2005 and 2010 was 66 deaths per 1,000 live births. The estimate of child mortality (age 12 months to 4 years) was 50 deaths per 1,000 live births, while the overall under-5 mortality rate for the same period was 112 deaths per 1,000 live births. The neonatal mortality rate was 31 deaths per 1,000 live births. The post-neonatal mortality rate was 35 deaths per 1,000 live births. These rates are among the highest in the world. Dental and oral health conditions do not feature very highly in the Malawi Demographic and Health Survey. Yet a recent study published in 2016 shows that oral health problems are a major public health challenge in Malawi such that the publishers proceed to recommend that their findings be used to develop evidence-informed national policy, action and resource mobilization plan and community based interventions to reduce the prevalence of oral health problems in Malawi [2]. This important study showed that 21 % of adolescents aged 12–15 years and 49 % of adults aged 35 years or more had dental caries, while 48 % and 80 % of the population aged 35–44 and 65–74 years had missing teeth respectively. The study also showed that women were affected more than men and brushing of teeth was not practiced by a large number of persons in the study. These findings also build a case for recommending that Malawi should consider adopting newer technologies such as those that shift dental material design from bioinert to bioactive ones in order to

regulate the biological response of biomineralized tissue [3]. Every year the Malawi government and development partners spend millions of dollars to support the health sector services and research activities in the country.

In the face of the country's fight against infectious diseases and global interest to achieve Sustainable Development Goals (SDGs) there has been global call to align funding of infectious diseases and non-communicable diseases (NCDs) which were originally excluded from the millennium development goals resulting in poor donor response. It is reported that despite rising numbers of deaths due to NCDs in sub-Saharan Africa, by 2018, less than 2% of the total development assistance for health was allocated to NCDs [4]. In 2016 Malawi responded with a launch of the Malawi Non-Communicable Diseases and Injuries (NCDI) Commission [5]. The Commission reports that according to Global Burden of Disease (GBD) study estimates, 38% of the burden of disease from NCDs in the country is caused by the: diabetes, cardiovascular diseases (CVD), cancer, and chronic lung diseases. We hypothesised that dental and oral health conditions are also an important part of NCDs in Malawi that equally require attention from policy makers and funders. We looked for additional evidence in terms of peer-reviewed publications concerning the country in this health area of interest especially in line with achievement of SDG3 which is about Good Health and Well-being for all.

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## Literature review

We conducted literature review to map publication landscape for dental and oral health in Malawi and assess how presented evidence is relevant to decision-making. Using key words, we searched databases commonly used by researchers namely PubMed and Google Scholar. We also supplemented our searches with the bibliographic database of a local private Malawian medical research company called Clinical Research Education and Management Services (CREAMS), which was published in June 2012 as an online resource via the company's website [www.creamsmw.com](http://www.creamsmw.com). The CREAMS website displays over 2,500 records of health research conducted in Malawi from 1964 but authored by approximately 6,000 clinicians and researchers from many parts of the world. All media reports that are not peer-reviewed were excluded from the search. The studies and publications extracted from our literature search were tabulated to indicate the common occurring themes and their relevance to informing strategies for decision-making.

## Results

Table 1 shows the number of studies and reports (N=9) on dental and oral health in Malawi which we found in databases commonly searched by researchers and a locally produced country specific database. We identified 9 publications addressing dental and oral health, most indicating that this is one of the biggest causes of morbidity in Malawi. Four of these publications have high relevance to achieving SDG3. The rest have either moderate or low relevance. The SDG3 relevant studies show that vulnerable populations like pregnant women, non-pregnant women and school children fall victims to dental and oral diseases in Malawi. Most of the quoted studies are cross-sectional in design and it is evident that in this discipline Malawi lacks adequate numbers of complementary studies that could help in driving the SDG3 agenda and, effective studies such as clinical trials, social science studies and economic analyses are currently lacking among the publications from Malawi.

## Discussion

Our study shows that dental and oral health conditions affect most Malawians but the area lacks adequate research for evidence that may lead to changes in policies towards meeting SDG3 indicators. To translate clinical and public health research findings into health

policy, scientists use policy briefs and systematic reviews of published research from different sources and databases where such findings are stored. This meta-analysis of published research is a transparent and internationally acceptable method of using statistically significant results to formulate policy and practice. Globally there are several databases that store published health research which include The Cochrane Library, MEDLINE, EMBASE, CINAHL, Web of Science, and Health Economic Evaluations Database. Meta-analysis is not easy to accomplish in poor-resource settings due to lack of capacity. Even in countries where research outputs are big health system managers, national or local policy makers and healthcare professionals can face several challenges when attempting to utilise databases for evidence. These include constraints operating within the health system, dealing with a large volume of research evidence and difficulties in adapting evidence from systematic reviews so that it is locally relevant [6]. Collected research should also be conducted to the highest standard if it was to be used meaningfully. It is also worth mentioning though, that clear research findings are not always an open avenue to policy [7]. Sometimes researchers cannot effectively communicate research findings to policy makers. There are many documented barriers to effective communication between researchers and users which include career structures, professional hierarchies, institutional barriers, ownership issues, barriers relating to the protracted process of publication in academic journals, technical barriers and problems related to secrecy and lack of trust [8]. This shows that a road from good and enough research to policy is a long winding road that needs good investments in time and resources. Our study shows that the research outputs in dental and oral health in Malawi are still low. For the dental and oral health programme in Malawi to influence policies its research output needs to be strengthened in terms of the types of research and their publications. Consideration in adopting newer technologies such as those that shift dental material design from bioinert to bioactive for reasons explained above would be advisable.

## Authorship and contribution

Both SHC and TN contributed to literature search and the structuring and editing the paper, CC and HJ contributed their ideas through information from CREAMS online database, while WS, FS and JC are students from Youth with Talents which is an organisation with interest in science studies on Malawi.

**Table 1.** Literature search of dental and oral health publications of Malawi and their relevance to SDG3

Study /report publication	Theme	Relevance to SDG3
Kathleen M. Antony, et al. Population-Based Estimation of Dental Caries and Periodontal Disease Rates of Gravid and Recently Postpartum Women in Lilongwe, Malawi. <i>AJP Rep.</i> 2019 Jul; 9(3): e268–e274. doi: 10.1055/s-0039-1695003	Obstetric care	Very high (up to 70% of child-bearing women had dental caries)
Liam Shaw, et al. Distinguishing the Signals of Gingivitis and Periodontitis in Supragingival Plaque: a Cross-Sectional Cohort Study in Malawi. <i>Appl Environ Microbiol.</i> 2016 Oct 1; 82(19): 6057–6067. doi: 10.1128/AEM.01756-16.	Clinical care	Very high (most women are affected by periodontal disease)
Kelias Phiri Msyamboza, et al. Magnitude of dental caries, missing and filled teeth in Malawi: National Oral Health Survey. <i>BMC Oral Health.</i> 2016; 16: 29. Published online 2016 Mar 9. doi: 10.1186/s12903-016-0190-3	Clinical care	Very high (20-80% of population have dental disease)
Sonja M. Kalf-Schoite, et al. Atraumatic Restorative Treatment (ART): A Three-year Clinical Study in Malawi–Comparison of Conventional Amalgam and ART Restorations. <i>Journal of Public Health Dentistry.</i> Volume 63, Issue 2: 01 May 2007	Dental reconstruction/ filling	Moderate
Sajidu SM et al. Drinking water quality and identification of fluoritic areas in Machinga, Malawi. <i>Malawi Journal of Science and Technology.</i> Vol. 8 No. 1 (2007)	Dental flourosis among school children	Low
Ungar PS, Grine FE, Teaford MF and El Zaatari S. Dental microwear and diets of African early Homo. <i>J Hum Evol</i> 2006 Jan	Evolution studies	Low
Igbigbi PS and Lebona S. The position and dimensions of the mental foramen in adult Malawian mandibles. <i>West Afr J Med</i> 2005 Jul-Sep	Anatomy	Low
JMP Moorhouse and PJJ Lancaster. Oral health status in southern Malawian school children: part I. Vol. 8 No. 2 (1992)	Clinical care	High (Urban vs rural periodontal disease)
Smith AJ, Chimimba PD, Kalf-Scholte S and Bouma J. Clinical pilot study on new dental filling materials and preparation procedures in developing countries. <i>Community Dent Oral Epidemiol</i> 1990 Dec	Dental reconstruction/ filling	Moderate

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## Conflict of Interest

None

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