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Financial Projections and Acceptability of Earmarked Fuel Levy to Finance Health in Tanzania—A Pilot Study

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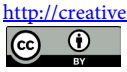

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Abstract

Fiscal gaps and donor dependency threaten the progress and sustainability of health programs in developing countries. This study aims to assess the acceptability and revenue generated from earmarked fuel levy for health in Tanzania. A survey was conducted in Dar es Salaam region in 2019 using a structured questionnaire. Survey data and fuel consumption rates were used to populate a decision-tree model to estimate revenues. The results were subjected to a one-way sensitivity analysis of plausible changes in key parameters. Analyses were done in Stata version 16.1 and TreeAge Pro® 2021. 400 participants were interviewed. 98 percent accepted earmarked fuel levy to finance health, of which two-thirds were willing to pay not more than 30 TZS (0.013 USD) per liter. A levy of 10 TZS/liter (0.004 USD) and 30 TZS/liter (0.013 USD) of diesel and petrol will generate 29 billion TZS (12.7 million USD) and 88.2 billion TZS (38.4 million USD), respectively. The fuel levy earmarked for health has the potential to generate significant revenues to finance healthcare in Tanzania.

Keywords

Tanzania, Innovative Financing, Six Tax, Fuel Levy, Universal Healthcare

1. Introduction

Tanzania is the largest country in the East African region covering 940,000 square kilometers and borders eight countries and the Indian Ocean. Tanzania is the union of Tanganyika and the semi-autonomous islands of Zanzibar. It has a total population of 57 million inhabitants (NBS, 2018), of which more than

three-quarter resides in rural areas. Approximately 44 percent of the population is under the age of 15 years (NBS & OCGS, 2013). The burden of disease in Tanzania is predominantly caused by communicable diseases. Lower respiratory tract infections, HIV/AIDS, tuberculosis, malaria, and diarrheal diseases are among the top ten causes of death (IHME, 2020). Like in many other low- and middle-income countries (LMICs), non-communicable diseases (NCDs) including cardiovascular diseases, diabetes, and injuries are increasing in Tanzania (IHME, 2020). This epidemiological shift is associated with additional health needs for the population, inducing an upsurge of cases and consequential healthcare costs (MoHSW, 2015).

Before the COVID-19 pandemic, Tanzania had one of the fastest-growing economies in the world with an annual Gross Domestic Product (GDP) growth of 7 percent (The World Bank Group, 2021). As of 2018, gross national income (GNI) per capita was 1,020 USD, and Tanzania according to the definition of the World Bank, achieved a lower-middle-income status (World Bank, 2019). The Tanzanian health system is financed mainly through tax-based government revenues, external assistance from donors, out-of-pocket health expenditure, and health insurance schemes. In a traditional lower-middle-income country like Tanzania, user fees constitute a substantial portion of healthcare costs, which is approximately 30 percent (Wang et al., 2018).

In Tanzania, user fees in the health sector were introduced in the mid-1990s, to complement government financing as a result of the growing funding gap in the health sector (Ministry of Health, 1994). Pregnant women, children under the age of five years, the elderly, those suffering from HIV/AIDS, TB and Leprosy, cancer, diabetes, meningitis, and those attending family-planning-related services were exempted (Ministry of Health, 1994). However, evidence has shown that fee-for-service is associated with reduced utilization of health services in low- and middle-income countries, especially among the poor and vulnerable (Lagarde & Palmer, 2011). Those with scarce resources have been shown to face both direct and indirect costs related to health care (Abel-Smith & Pankaj, 1992), which expose them to catastrophic health expenditures that put them further at risk of impoverishment and poverty (McIntyre et al., 2006). Although out-of-pocket payments remain an important fraction of total health expenditures in Tanzania, there has been significant progress toward a reduction in user fees with a decline from 47 percent in 2000 to an estimated 26 percent in 2015 (Wang et al., 2018).

The government of Tanzania has embarked on an ambitious endeavor to achieve universal health coverage (UHC) to ensure all citizens have access to the health services they need without experiencing financial hardships. This is a formidable challenge considering low tax efficiency, fragmented health insurance market, and high level of out-of-pocket health payments, which could counter the prospects of successfully implementing UHC. According to Health Sector Strategic Plan (HSSP) IV, Tanzania has a huge funding gap to ensure all its citizens have access to essential health and social welfare services. Between 2015 and 2019, the funding gap was estimated to have increased from 126 to 138

million USD, according to the most ambitious fiscal space scenario (MoHSW, 2015). The new HSSP V further estimates resource requirements for health will be about 4 billion USD annually between 2021 and 2025 (MoHCDGEC, 2021a).

Improving public financing, particularly through general taxation has been shown to have the greatest impact on UHC indicators of improving health service coverage and financial protection (Reeves et al., 2015). However, while improving general taxation is crucial to increase domestic revenue collection, it is very unlikely that countries like Tanzania will be able to raise sufficient financial resources in the short and medium-term through this means. It is argued that even if the current economic growth increases considerably in the near future, domestic resource mobilization alone will fall short to enable the achievement of UHC (Koutsoumpa et al., 2020). Therefore, Tanzania needs to explore innovative financing strategies to close the fiscal gap to finance UHC.

The World Bank Group uses innovative financing as an overarching term which includes any financial approach that enables additional funds generation by utilizing new funding sources or engaging new partners or increasing efficiency by reducing time and service delivery costs (Le Gargasson & Salomé, 2010; World Bank Group, 2010). Innovative financing is often linked to taxes on goods and services which include taxes levied on the production, extraction, sale, transfer, leasing, or delivery of goods, and the rendering of services, or on the use of goods or permission to use goods or to perform activities (OECD). Since 1990, consumption taxes have contributed most to revenue growth in LMICs (Reeves et al., 2015). Revenues extracted from consumption taxes have the potential to provide direct financial contributions to the development of health systems, while at the same time improving public health through altered consumption patterns, particularly on harmful products like tobacco, alcohol, and sugar-sweetened beverages, i.e., sin taxes (Miracolo et al., 2021; Wright et al., 2017). A study from neighboring country Malawi showed that earmarked tax from fuel was a high potential area for revenue collection, however with low political feasibility, consumer acceptability, and negative effects on business and trade (Chansa et al., 2018).

In comparison to donor contributions, revenues extracted from innovative financing is still small on a global scale, but within this mechanism of pooling funds for financing healthcare lie huge untapped potential (World Bank Group, 2010). While most studies advocate for earmarked taxes for health from harmful products such as tobacco, alcohol, or other financing options, only a few have gone far to estimate the actual amount of revenue that could be raised. Therefore, this paper based on a pilot study aims to assess the acceptability and revenue generated from earmarked fuel levy for health in Tanzania.

2. Methodology

2.1. Study Design

This is a cross-sectional study, which means a collection of data at a particular

point in time. Information about public acceptability was obtained by administering a questionnaire while financial projections were estimated by decision tree modeling using survey data and fuel consumption rates as model inputs.

2.2. Study Setting

The study was conducted in Dar es Salaam region in Tanzania from June to August 2019. Dar es Salaam is located on the shores of the Indian Ocean and is the main business hub of Tanzania. With an estimated population of 7 million people, it is the most populated city in the country and the East African region (World Population Review, 2021). Dar es Salaam is also the most densely populated region in Tanzania, with a population density of more than 3100 people per square kilometer (World Population Review, 2021). The region is sub-divided into five districts. Culturally, Dar es Salaam is sprawling with diversity as it attracts migration from other regions of Tanzania. The main means of public transport include minibusses (commonly referred to as daladala), motorcycles taxies (commonly referred to as bodaboda), rapid bus transport, railway, and ferries.

The study was conducted at nine different but purposively selected sites from seven locations around Dar es Salaam to target users of road vehicles with different attributes. To diversify study participants' income status, some locations were selected from low wealth areas, while others were from high wealth areas. In specific locations, such as in-hospital vicinities, it was assumed that the well-off population prefers private transportation rather than public transportation when accessing hospitals.

2.3. Sample Size

A literature search was conducted to identify whether previous research had been performed on this specific topic. No evidence of such was revealed. Hence, to maximize the sample size we assumed a prevalence of 50 percent for the primary outcome (Usha et al., 2018), a margin of error of 5 percent, which gave us a sample of 384 participants. The sample size was adjusted upward to 400 to account for non-response. Sample calculation was done in OpenEpi version 3.01.

2.4. Study Population

To obtain reliable information from credible sources, it was considered appropriate to target the populations most likely to be affected by the proposed fuel levy. Specifically, purposive sampling was used to engage users of road vehicles, who were defined as any person who carries expenses in relation to road vehicle utilization. Expenses refer to recurring costs, e.g., fuel consumption and fare for public transportation. Inclusion criteria covered study participants being 18 years or older and whether he or she was a driver or an owner of either the 3-wheeled bajaj, car, motorcycle or a passenger. Exclusion criteria included being less than 18-year-old or carrying no expenses about public transport utilization.

2.5. Data Collection

A questionnaire with closed-ended questions was used for data collection. The tool consisted of 26 questions and was originally written in English but translated into Swahili, which is a national language and universally spoken by all Tanzanians. The first part of the questionnaire contained questions about demographic, socioeconomic, and health determinants information. The second part of the questionnaire had questions to evoke attitudes towards fuel taxation as a means to finance healthcare, as well as willingness to pay.

In assessing willingness to pay, we used the contingent valuation method with open-ended questions (Frew et al., 2003). As the method requires, we started by describing the product in the form of four related questions for each respondent. This was important to ensure we get consistent responses with regards to other products deemed to contribute to the burden of disease. After these questions, study participants were asked how much they would be willing to pay per liter of fuel to finance health if a fuel levy was introduced the next day.

The questionnaire was first piloted among a few numbers of users of road vehicles to determine the time to be used for its completion and to check for inconsistencies before data collection. A local research assistant was engaged and instructed on the purpose of the study and further familiarized with the survey during this exercise. In addition, the research assistant worked in the capacity of a translator and was instrumental in the process of collecting the data.

2.6. Statistical Analysis and Decision Modeling

Descriptive analysis was used to establish frequency distributions of variables. Pearson's Chi-square and Fisher's exact tests were used to establish the association between categorical variables. We used ownership of assets, housing characteristics, and access to utilities to construct a wealth index using a Principal components analysis (PCA) method. PCA is a multivariate statistical technique that enables the analyst to reduce the number of variables within a dataset to a narrower number of dimensions (Vyas & Kumaranayake, 2006). Analyses were conducted in Stata® 16.1. We built a decision tree model in TreeAgePro version 2021® to visualize choices and calculate outcomes related to the proposed levies, as well as to perform sensitivity analyses.

The models' inputs were six distinct categories of fuel levies and the consumption rate of petrol and diesel. Revenues were calculated by multiplying the levy amount per unit volume of fuel and the quantity consumed per year. Baseline fuel consumption rates were extracted from Energy and Water Utilities Regulatory Authorities (EWURA) annual report from the Tanzanian mainland in FY 2017/18 (EWURA, 2018). The models' output was gross revenues associated with each category of the levy. Analysis was performed by rolling back the decision tree. Fuel prices were reported in Tanzanian shilling (TZS) and converted to USD using an exchange rate of 1 USD = 2300 TZS. We noted that from the financial year 2016/17 to 2017/18, the consumption rate of diesel increased

by 7 percent while the consumption of petrol decreased by 6 percent (EWURA, 2018). Therefore, on sensitivity analysis, the fuel consumption rates were adjusted up and down by 5 and 20 percent.

2.7. Ethical Considerations

Ethical clearance was obtained from the Research and Publication Ethical Review Committee of Muhimbili University of Health and Allied Science in Tanzania. The ethical clearance grant from the Regional Committees for Medical and Health Research Ethics (REK) in Norway was not relevant due to the lack of sensitive information attached to this study. All participants signed a consent form. No identity-revealing information was collected.

3. Results

Table 1 shows the baseline characteristics of the study participants. The male to female ratio was just shy of 3:1 and about three-quarters of the respondents were aged between 18 - 45 years. About 85 percent resided in densely populated areas of Dar es Salaam. It is also worth noticing that most of them had completed ordinary level secondary education and nearly half were employed in the formal sector. The study participants appear to be healthy, with roughly three-quarters indicating a "good" or "very good" health status. Out-of-pocket was the primary mechanism to pay for healthcare services. On the question of whether study participants or any family members had sustained Road Traffic Injuries, 85 percent answered "yes".

The results show that public acceptability of earmarked marginal levy for tobacco, alcohol, sweets/soft drinks, and fuel was overwhelmingly high i.e., more than 95 percent for all except sweets/soft drinks at 92 percent. Nearly all the participants i.e., 98 percent agreed that road users should pay a small levy to finance health care. Figure 1 shows that all were willing to contribute 10 TZS or less per liter if the levy was to be introduced the next day, while about 61 percent were willing to pay less than 30 TZS or less per liter.

Table 2 shows the association between different the category of levy that participants were willing to pay and demographic and socioeconomic factors. Willingness to pay was associated with age, education level, and socioeconomic status.

As indicated in Figure 2, a levy of 10 TZS (0.004 USD)/liter of petrol and diesel will generate revenue of 29.4 billion TZS (12.8 million USD) annually, while a 30 TZS (0.013 USD) will generate 88.2 billion TZS (38.4 million USD). At 100 TZS (0.04 USD), the revenue generated will be 294 billion TZS (127.8 million USD). A levy on petrol is less lucrative than a levy on diesel due to a higher consumption pattern of diesel.

Figure 3 shows the sensitivity of revenue collection to changes in consumption rates for diesel and petrol by a 5 - 20 percent increase. From 2018 to 2020, the consumption rate of diesel increased by 13 percent, while that of petrol increased by about 11 percent. This corresponds to an increase in revenues from

Table 1. Baseline characteristics of the study participants.

Variable	Characteristics	n (%)
Sex	Male	239 (62.2)
	Female	145 (37.8)
Age (years)	18 - 25	56 (14.6)
	26 - 35	97 (25.3)
	36 - 45	140 (36.5)
	46 and above	86 (22.4)
Residence (district)	Kinondoni	107 (27.9)
	Ilala	91 (23.7)
	Temeke	130 (33.9)
	Other	51 (13.9)
Education level	No education	17 (4.4)
	Primary school	74 (19.3)
	Ordinary secondary	67 (17.4)
	Advanced secondary	78 (20.3)
	College/university	145 (37.8)
Employment	No employment	53 (13.8)
	Informal sector	144 (37.5)
	Formal public sector	37 (9.6)
	Formal private sector	138 (35.9)
Health status	Very poor	9 (2.3)
	Somewhat poor	60 (15.6)
	Good	261 (68)
	Very good	48 (12.5)
Healthcare utilization	Monthly	37 (9.6)
	Less than 6 times/year	234 (60.9)
	More than 6 times/year	107 (27.9)
Health payment	Insurance	126 (32.8)
	Out-of-pocket	233 (60.7)
	Exempted	13 (3.4)
	Other	4 (1)
Traffic accident	Yes	328 (85.4)
	No	48 (12.5)
Socioeconomic status	Poorest	98 (25.5%)
	2nd	94 (24.5%)
	3rd	96 (25.0%)
	Least poor	96 (25.0%)

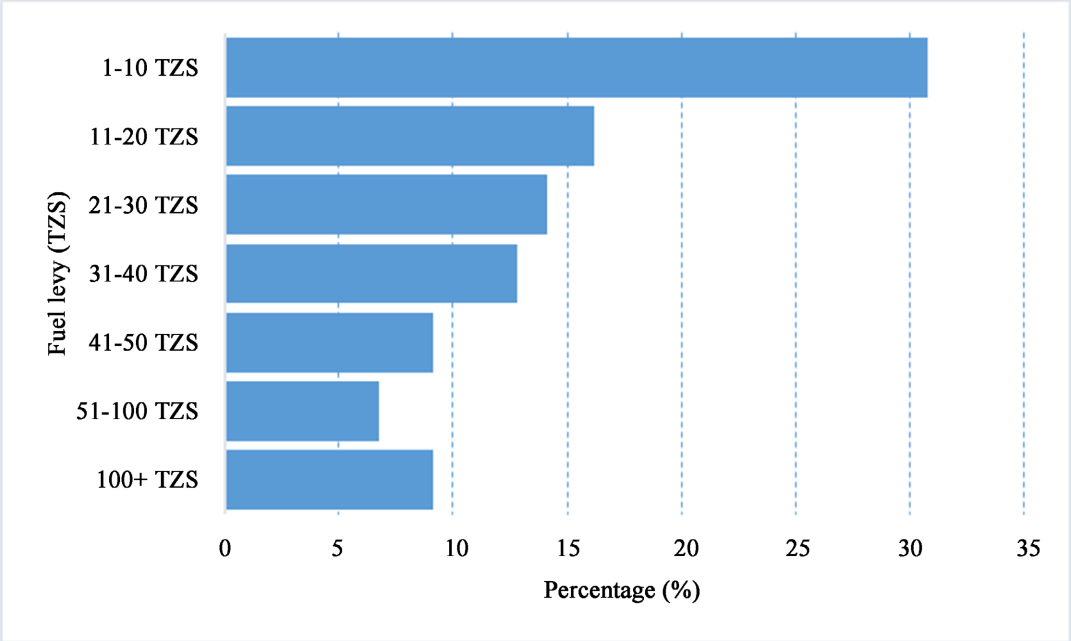

Figure 1. Acceptability of different categories of fuel levy.

Table 2. Factors associated with willingness-to-pay.

	Fuel levy (in TZS)				*p*-value
	1 - 10 TZS	11 - 20 TZS	21 - 30 TZS	31 TZS & above	
Gender					$p = 0.98$
Male	73 (62%)	39 (63%)	32 (59%)	90 (62%)	
Female	45 (38%)	23 (37%)	22 (41%)	55 (38%)	
Age (years)					
18 - 25	32(27%)	10 (16%)	4 (7%)	10 (7%)	$p < 0.000$
26 - 36	37 (31%)	21 (34%)	8 (15%)	31 (21%)	
36 - 45	32 (27%)	21 (34%)	28 (52%)	55 (38%)	
46 and above	17 (14%)	10 (16%)	14 (26%)	49 (34%)	
Education					
Primary school and below	38 (32%)	10 (16%)	6 (11%)	37 (26%)	$p < 0.000$
Completed O-level secondary	28 (24%)	12 (19%)	4 (7%)	23 (16%)	
Completed A-level secondary	14 (12%)	17 (27%)	21 (39%)	26 (18%)	
College/university	38 (32%)	23 (37%)	23 (43%)	59 (41%)	
Employment					
Not employed	17 (15%)	9 (15%)	6 (11%)	21 (15%)	$p = 0.47$
Informal sector	43 (38%)	19 (32%)	17 (32%)	64 (45%)	
Formal public sector	8 (7%)	7 (12%)	5 (9%)	16 (11%)	
Formal private sector	44 (39%)	25 (42%)	25 (47%)	42 (29%)	
Socioeconomic status					
Poorest	36 (31%)	7 (11%)	7 (13%)	48 (33%)	$p < 0.000$

Continued

2	41 (35%)	15 (24%)	11 (20%)	26 (18%)	
3	26 (22%)	21 (34%)	25 (46%)	45 (31%)	
Least poor	15 (13%)	19 (31%)	11 (20%)	26 (18%)	
History of road accident					
Yes	15 (13%)	7 (11%)	5 (9%)	21 (15%)	$p = 0.71$
No	102 (87%)	55 (89%)	49 (91%)	118 (85%)	
Means of health payment					
Out-of-pocket	88 (75%)	29 (50%)	29 (54%)	85 (59%)	
Health insurance	25 (21%)	29 (50%)	23 (43%)	47 (33%)	$p = 0.001$*
Other	4 (3%)	0 (0%)	2 (4%)	11 (8%)	

*Fisher exact test.

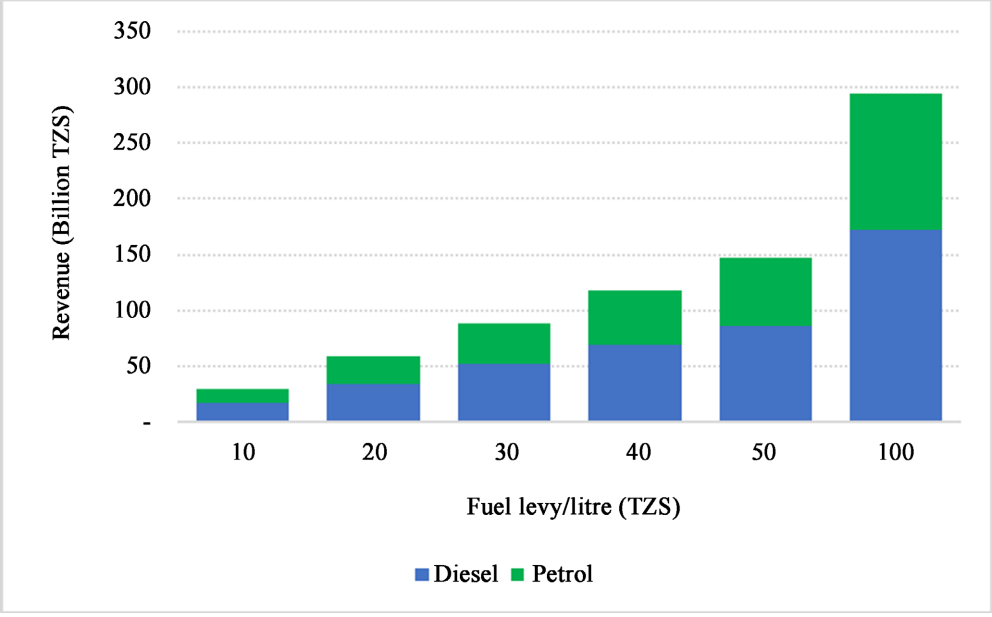

Figure 2. Revenues generated from different levels of fuel levies.

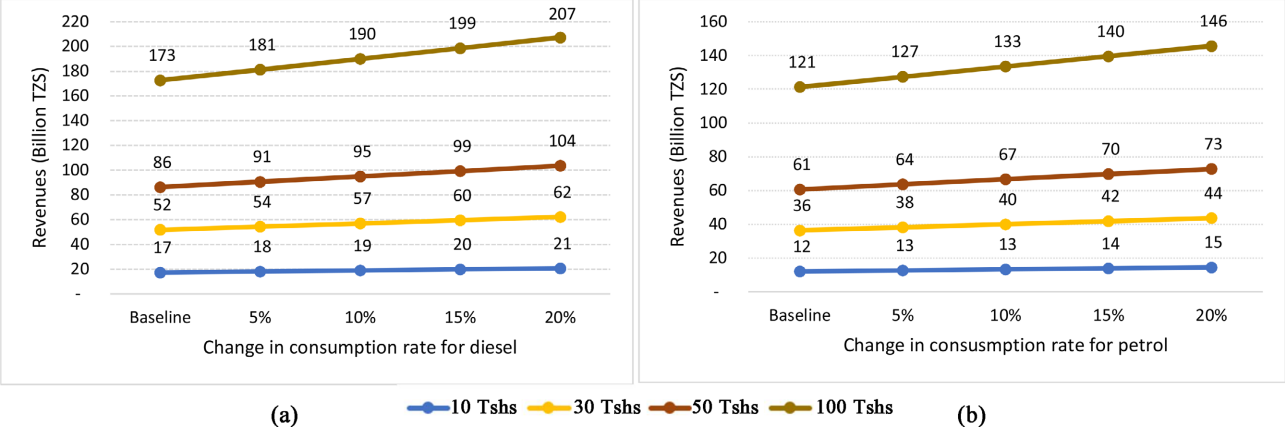

Figure 3. Sensitivity of revenue collection to change in diesel (a) and petrol (b) consumption rates.

diesel of about 19.5, 58.5, 97.6, and 195.1 billion TZS for the 10, 30, 50, and 100 TZS/liter levy categories, respectively.

For petrol, the increase in 11 percent consumption rate corresponds to 13.5, 40.4, 67.3, and 134.7 billion TZS for the 10, 30, 50, and 100 TZS/liter levy categories, respectively. Therefore, in total, these levels of fuel consumption rates will generate 33.0 billion TZS (14.3 million USD), 98.9 billion TZS (43.0 million USD), 164.9 billion TZS (71.7 million USD), and 329.8 billion TZS (143.4 million USD) for the 10, 30, 50 and 100 TZS/liter categories of fuel, respectively.

4. Discussion

Tanzania has committed to the ambitious goal of universal health care (UHC). However, when a considerable proportion of the budget is covered by donor contributions and out-of-pocket health payments (OOP), the UHC goal may be fiscally challenging to achieve. As donor contributions are declining in developing countries, it has become increasingly important to supplement the health budgets through innovative financing strategies to increase revenues from domestic resources. Such measures include the introduction of excise duties on goods and services that are thought to contribute to the burden of disease, including tobacco, alcohol, and sugar-sweetened beverages (SSB) (Miracolo et al., 2021). There are many examples of countries that have earmarked tax revenues from tobacco, alcohol, and SSB to promote health and increase funding for health (Cashin et al., 2017).

From a global health perspective, and in light of Tanzania's ambitious efforts of achieving UHC, there exists growing recognition that health funding from domestic sources is becoming increasingly important (Meheus & McIntyre, 2017). The issue of raising sufficient revenues to finance UHC is one of the most fundamental factors to succeed with appropriate financing of the healthcare system (Meheus & McIntyre, 2017). Taxation of products or goods that are deemed harmful to individuals and costly to society is increasingly important in developing countries, not only to discourage unhealthy consumption and behavior but also to increase domestic revenues to finance healthcare. In the case of Thailand, which introduced UHC in 2002, a 2 percent levy on alcohol and tobacco generated 50 - 60 million USD annually for health financing (Srithamrongsawat et al., 2010).

4.1. Acceptability and the Potential for Revenue Generation

The study shows that the majority of the study participants were positive with the idea of introducing a fuel levy to finance healthcare, the only difference was how much they were willing to contribute. The introduction of an earmarked fuel levy to finance healthcare represents an opportunity to increase domestic revenues for improving health services. Depending on the amount of levy to be introduced, between 12.8 and 128 million USD can be generated from petrol and diesel to help reduce the funding gap for essential health in-

terventions. To put these numbers in perspective, according to Fell et. al the Tanzania incurs expenditures ranging between 1.2 - 1.5 million USD annually due to traffic accidents, (which include costs related to emergency response, damage to property, loss of productivity, and medical costs) (Fell et al., 2017). Another area that can potentially benefit from these kinds of taxes is the vaccine program. Currently, five expensive vaccines are co-financed by GAVI, and it is projected that the budget will increase from 60 million USD in 2021 to 82.7 million USD in 2025 (MoHCDGEC, 2021b). However, since becoming a lower-middle-income country Tanzania will start to contribute by price fraction from 2023. By 2025 the country will contribute 10 percent of new vaccine prices, compared to the current 0.2 USD per dose (MoHCDGEC, 2021b); hence earmarked sin taxes for health have the potential to increase the financial sustainability of the program.

Evidence from Malawi also showed that earmarked tax from fuel was a high potential area for revenue collection with high public health potential, however with low political feasibility, consumer acceptability, and negative effects on business and trade. Under low and high levies between 5.4 to 11.6 million USD were projected to be generated from three fuels (petrol, diesel, and paraffin) and motor vehicle insurance between 2017 to 2022 (Chansa et al., 2018). In July 2021, the Tanzania Government increased the fuel levy by 100 TZS per liter of petrol and diesel to facilitate the construction and maintenance of roads under the Tanzania Rural and Urban Roads Agency (TARURA) (Ssebuyoya, 2021). The new toll has raised widespread criticism from consumers across the country. Based on our model, the 100 TZS per liter of fuel could rise 329.8 billion TZS (143.4 million USD) per year. We argue that 30 percent of this (30 TZS/liter) should be earmarked for healthcare since it corresponds to the amount the majority of the respondents were willing to contribute.

4.2. Theories about Attitudes on Taxation

There are at least five theories that may explain taxpayer attitude and behavior for willingness to pay or not pay for additional fuel levy, which include economic deterrence, fiscal exchange, social influences, comparative treatment, and political legitimacy (Ali et al., 2014). The relatively high willingness to pay for added fuel levy can be explained by the fiscal exchange theory where the taxpayers expect the better provision of public goods and services in exchange for their tax. Findings from this study show that more than 90 percent of the respondents were in favor of taxation of harmful products such as tobacco, alcohol, candy, and sugar-sweetened soft drinks, as well as fuel to finance healthcare. These findings show that respondents desire UHC and are expressing compliance with domestic taxation as a mechanism to finance healthcare. A study including the East African countries and South Africa indicated that for Tanzania, tax compliance increased with the government's provision of better health and education services (Ali et al., 2014).

4.3. The Negative Impact of Added Fuel Levy

A tax performance analysis conducted in 2006, showed that motor fuel exhibited a price-inelastic demand in Tanzania, meaning that motor fuel was prone to increased taxation without interfering with the overall demand for fuel (Osoro et al., 2006). Accordingly, the Tanzania Revenue Authority has increased revenues from a fuel levy from 95 to 1,107 billion TZS between 2006-2018, with the equivalent of 4.4 percent annual growth between 2016/17-2017/18 (NBS, 2019). While imposing more taxes on fuel earmarked for financing health is attractive, evidence shows that poor households in developing countries, both urban and rural settings are particularly vulnerable to an increase in food prices which can be directly affected by the rise in fuel prices (Ngare & Derek, 2019). For example in Kenya, an increase in diesel prices resulted in a significant rise in perishable food prices, such as cabbage and potatoes, and such events can lead to negative effects on food consumption and food investments (Ngare & Derek, 2019).

Increased food prices due to the introduction of an additional fuel levy may also lead to considerable social unrest, as was the case in North Africa and the Middle East in 2011 (Lagi et al., 2011). It is for these reasons that many of those who are against fuel taxes argue that they are regressive. As the introduction of a fuel levy to finance healthcare is likely to directly increase fuel prices, responsible governance and equity considerations about food security and the availability of essential goods must be acknowledged and accentuated by policymakers. A methodology based on public perceptions, as shown by this study, would help achieve the goals of responsible governance, including societal participation, and equity. More importantly, taxes collected from the fuel can be passed on to the poor by investing in UHC to reduce OOP expenditure that disproportionately affects the poor.

4.4. Strengths and Limitations

Research addressing the potential of taxing public health goods like tobacco, alcohol, and SSB, with the intent to promote public health and increase domestic taxation in a developing country, is wide. However, literature on how much revenue could be generated from these sources to finance health is scarce, hence this study provides a valuable addition to the current knowledge gap. The results of this study implicate that public perception towards taxation can be positive under the condition that taxpayers have a say about the relevance of the tax in question (e.g., a tax-relevant for financing healthcare), and the amount of the levy to which it applies. It also provides financial projections based on public perceptions which start from marginal levies but reveal estimates of potentially considerable revenues. This study supports the encouragement of promoting equity in healthcare financing.

The study has several limitations. First, the study participants were identified in areas, which function as connection points for public and private transport in Dar Es Salaam. This circumstance led to the engagement with groups of drivers

and passengers who completed the survey close to each other, which introduced an information bias. To which degree participants were genuinely sincere in their responses is therefore uncertain. Second, the study setting was exclusively urban, and given that approximately 70 percent of Tanzanians are rural dwellers, this study does not encapsulate public perceptions from a rural perspective. Therefore, the results regarding public perceptions may not be generalizable for the whole country. Third, the financial projections are expressed as gross revenues and did not encompass uncertainties in global oil market prices, nor administrative costs associated with implementing an additional fuel tax. Therefore, the results could have overestimated the actual amount available for spending in the health sector.

5. Conclusion

The findings of this study suggest that public perceptions are positive toward introducing a fuel levy to finance healthcare. Estimates show that there are potentially substantial revenues to be gained from a marginal fuel levy, which could be earmarked to close the funding gaps for essential health interventions. The results are promising, however, the lack of literature on this topic and the small sample size call for further research. In particular, a large study with a representative sample across the country is necessary to elicit attitudes towards a marginal fuel levy to finance healthcare on a national scale.

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Authors' Contributions

Amani Thomas Mori conceived the study, supervised data collection, analyzed the data, and wrote and revised the drafts of the manuscript. **Pål Sebastian Vognstølen** developed the data collection tools, participated in data collection and analysis, and contributed to writing and revising the manuscript. All authors have approved the manuscript for publication.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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