



TOBACCO CONTROL RESEARCH AGENDA for AFRICA

MARCH 2020



Research Agenda Conceptualization Session

TOBACCO CONTROL RESEARCH AGENDA *for* AFRICA



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through technical, institutional and cross sector support.

Tobacco Control Research Agenda for Africa

Contents: (1) Overview of the Tobacco Control Research Agenda,
(2) Background of Tobacco Control, (3) Strategic direction of the Research Agenda,
(4) Priority research areas and (5) Research Capacity in Africa

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FOREWORD

The Center for Tobacco Control in Africa (CTCA) is mandated to support African governments implement comprehensive evidence-based tobacco control policies and programmes. To accomplish this, CTCA, -- in collaboration with the academia, policymakers and advocates -- developed a Research Agenda to guide the generation of knowledge and evidence required for policy design and programme implementation. This Research Agenda provides guidance on how African researchers can generate evidence to drive the Tobacco Control response in Africa.

Despite the fact that more than one billion people in the world are smokers and that there's increasing tobacco use in low- and middle-income countries, there is scarce data in Africa. A systematic review of the designs and methods of the studies used to assess the progress of tobacco control research in Sub-Saharan Africa (SSA) over the past 50 years has concluded that the continent remains a "research desert" and needs more investment in tobacco control research and training.

Thus this Research Agenda identifies eight research priorities: 1) Patterns, trends and inequalities of tobacco use and exposure for all tobacco products, including the new products at country and regional levels, 2) Effects of tobacco use and exposure, and sustainable development, 3) Sociocultural context of tobacco use, 4) Tobacco use and populations at risk, 5) Policy analysis, evaluation and implementation research, 6) Tobacco production, alternative livelihoods, and environmental impact, 7) Tobacco industry; Monitoring of tobacco industry behavior, including efforts to influence tobacco control policy, 8) The economics of tobacco and tobacco control, and sub-themes, and further identifies existing research capacity and gaps, and provides guidance on strategies for building research capacity. Other key components include; the implementation plan, how to communicate the Agenda and its products, monitoring and evaluating the Agenda, coordination and dissemination.

I hope that this compilation by CTCA and its partners will be of value to governments and other TC actors in designing and implementing evidence-based tobacco control policies and programmes. It has been endorsed by our collaborators from several institutions including; Makerere University, the University of Pretoria, the University of Cape Town, Protestant University of Congo, University of Botswana, Cooperative University of Kenya, Institute of Legislative Affairs, Tax Justice Network Kenya, and Kenya Medical Research Institute.

CTCA welcomes any feedback which may be useful for improving subsequent versions of this Agenda. Please forward your comments to: ctca@ctc-africa.org

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ACRONYMS AND ABBREVIATIONS

AACHRD	African Advisory Committee on Health Research and Development
ATCLC	Africa Tobacco Control Learning Center
BMGF	Bill & Melinda Gates Foundation
CDC	Centers for Disease Control
CEDAW	Convention Eliminating Discrimination Against Women
CRES	Consortium for Economic and Social Research
CTCA	Center for Tobacco Control in Africa
CRC	Convention on the Rights of the Child
CSOs	Civil Society Organisations
DFID	Department for International Development
EVIPNet	Evidence-Informed Policy Networks
FCTC	Framework Convention on Tobacco Control
GDP	Gross Domestic Product
GHWs	Graphic Health Warnings
HICs	High Income Countries
ICCPR	International Covenant on Civil and Political Rights
ICESCR	International Covenant on Economic, Social and Cultural Rights
IDRC	Infectious Diseases Research Collaboration
IMS	Information Management System
LMICs	Low- and Middle-Income Countries
MDGs	Millennium Development Goals
M&E	Monitoring and Evaluation
MakSPH	The Makerere University School of Public Health
MOU	Memorandum of Understanding
NCD	Non-Communicable Diseases
NCI	National Cancer Institute
NEPAD	New Partnership for Africa's Development

NIH	National Institutes of Health
NHRS	New Hampshire Retirement System
PLWHIV	People Living With HIV
PPP	Public-Private Partnership
SDGs	Sustainable Development Goals
SHS	Second-Hand Smoke
SSA	Sub-Saharan Africa
SIDA	Swedish International Development Cooperation
TFG	Tobacco Free Generation
TAPS	Tobacco Advertising Promotion and Sponsorship
TB	Tuberculosis
TC	Tobacco Control
TCRA	Tobacco Control Research Agenda
TEM	Tobacco Epidemic Model
TI	Tobacco Industry
TII	Tobacco Industry Interference
TWG	Technical Working Group
UDHR	Universal Declaration of Human Rights
UHC	Universal Health Care targets
UNICEF	United Nations Children's Fund
USAID.	United States Agency for International Development
WHO	World Health Organization



OVERVIEW OF THE TOBACCO CONTROL RESEARCH AGENDA

The tobacco control community in Africa concurs research is pivotal for evidence-based policy and implementation. Research is equally vital to inform policymakers and to develop practical evidence-based tobacco control policies, strategies, programmes, and interventions. However, the current state of affairs is that the research that informs policymaking in the region is either sparse or conducted by international partnerships to answer questions specific to their needs. Though very helpful, they are limited to surveillance and prevalence data, which even then is not available for all the countries in Africa. Most worrying is that the youth prevalence data is even more limited regarding tobacco consumption and the heightened aggressive marketing of the tobacco industry among the youth in Africa.

While smoking prevalence has been decreasing globally, it is on the rise in Africa and the East Mediterranean regions. The World Health Organization (WHO) projects that tobacco use will increase by over 37% in many countries in the region by 2025. This will represent the fastest growth globally.

There is, therefore, urgent need for a Tobacco Control Research Agenda that articulates priority research areas, coordination and networking of research institutions and partners in the region.

The response to this growing tobacco epidemic on the continent will require local evidence to increase awareness and effectively formulate a tailored response to attain a tobacco free Africa. A number of gaps have been identified in tobacco control policy implementation which necessitates a harmonized approach to generate critical local evidence to drive the response. These include: (1) limited local evidence to drive best practices for policy adoption and implementation; (2) inadequate capacity for tobacco control research especially in non-health related areas such as economics, policy analysis and evaluation; (3) disjointed

platforms for communicating, disseminating and sharing best practices on tobacco control in Africa; and (4) the need to focus research funding towards high priority tobacco control areas.

The Tobacco Control Research Agenda for Africa (TCRA) addresses these research gaps by outlining a research framework that identifies research priorities and existing research capacities and gaps, documenting the existing research collaborations and teams, providing a guide for research coordination at regional and national level as well as identifying mechanisms that bring policymakers and researchers together to share information and translate research findings into actions. Tobacco control is dynamic and therefore requires updated evidence to suit the changing landscape and dynamic nature of the implementation environment.

This research agenda, therefore, is expected to continually guide tobacco control-related research and provide a platform to bring actors together to carry out evidence-based programming. The expected outcomes are a reduction of consumption of tobacco and other substances to prevent use, reduce risks, effects and related costs in the future. All these activities are expected to accelerate the implementation of the 1) World Health Organisation Framework Convention on Tobacco Control to realise universal right to health targets, 2) United Nations Sustainable Development Goals, 3) Universal Health Care targets such as the promotion of global health and well-being, and 4) Non-communicable disease targets. Simultaneously, the Research Agenda will help the African Parties to the World Health Organisation Framework Convention on Tobacco Control meet their obligations under Articles 20.

2

BACKGROUND OF TOBACCO CONTROL

More than one billion people in the world smoke – and there is an increasing tobacco use in low and middle-income countries. Despite this, there is still scarce data on the tobacco phenomenon in Africa. A systematic review of designs and methods of the studies to assess progress of tobacco control research in Sub-Saharan Africa (SSA) in the past 50 years has found that SSA remains a “research desert” and needs more investment in tobacco control research and training (Mamudu *et al*, 2018). However, as Mamudu *et al*, 2018, demonstrated, most research efforts have focused on surveillance, providing data on prevalence and policy monitoring while very little has been done on TC implementation science research including developing and testing scientific models that work in the context of Africa.

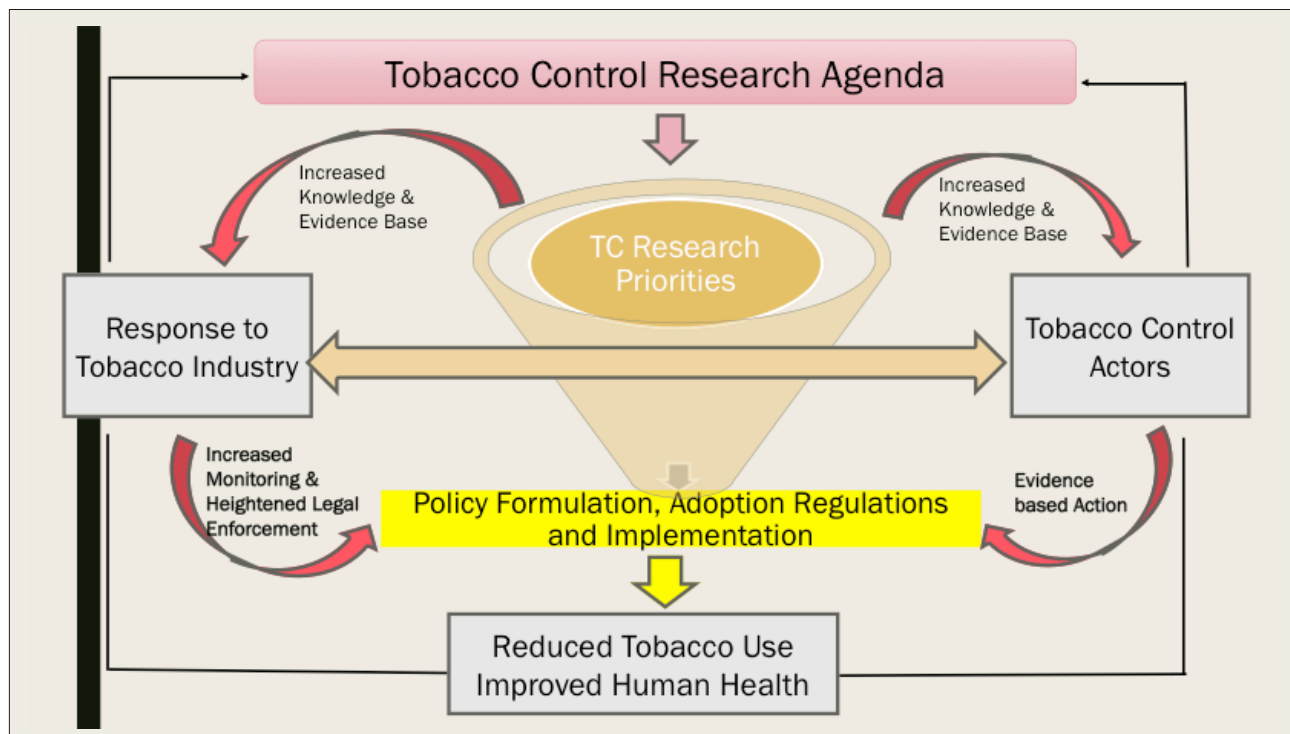
Article 20 of the WHO Framework Convention on Tobacco Control (WHO FCTC) mandates parties to develop, promote and coordinate research programs; conduct research and scientific assessments that can provide evidence to support the implementation of tobacco control policy. Tobacco control policies and regulations are at the heart of protecting humans against the harms associated with tobacco use and secondhand smoke exposure. Increased knowledge and evidence base are enabling factors to catalyze formulation, adoption, regulation and implementation of tobacco control policies (Figure 1). However, before evidence can be used to inform policy and regulations, it is often met with inertia or resistance from the tobacco industry which in turn delays, distorts and disrupts TC response thus decelerating the thrust from tobacco control actors. It is therefore imperative that research priorities which empower TC actors and countering the influence of the tobacco industry be identified and acted upon to promote public health.

Tobacco control is dynamic and therefore requires updated evidence to suit the changing landscape and evolving nature of the implementation environment. The Tobacco Control Research Agenda for

Africa (TCRA) addresses these research needs by outlining a research framework that identifies research priorities and existing research capacities and gaps, documenting the existing research collaborations and teams, providing a guide for research coordination at regional and national level as well as identifying mechanisms that bring policymakers and researchers together to share information and translate research findings into actions.

This TCRA will therefore allow for innovation in research, where researchers will be supported to conduct innovative research and provide disruptive ideas to better prevent and control tobacco use and NCDs. This will allow for Africa to generate fresh ideas and solutions for African problems. With the current limited research products that speak to Africa, the proposed research agenda is intended to provide a framework for African countries to prioritize research and implement evidence-based tobacco control policies. Furthermore, the TCRA implementation will avail platforms where researchers will be able to demonstrate the value of research to policy makers. More importantly the agenda will be able to increase research products on the continent, hence, increase Africa’s representation and participation in the global research forums, where they can share confidently the “African Story”.

FIGURE 1: CTCA Tobacco Control Research Agenda For Africa: Conceptual Framework



2.1 The Tobacco Epidemic

Many countries in Africa are in Stage I of the Tobacco Epidemic Model (TEM). They have a relatively low prevalence of tobacco use and tobacco-induced diseases and major gaps in the rates of tobacco use among men and women but signs of a rapid uptake of tobacco use (Thun *et al.*, 2012). Tobacco use remains a significant driver in the epidemiological transition from communicable to non-communicable diseases in Africa. The WHO projects that over the next 10 years, deaths in Africa from infectious diseases, maternal and perinatal conditions and nutritional deficiencies combined will increase by 6%, while deaths from non-communicable diseases will increase by 27%.

The prevalence of tobacco use among adults in Africa is estimated to be between 5% and 45%. Alarmingly, 17% of 13- to 15-year-old children in the region are already using tobacco products -- a statistic that matches the global average (WHO 2008b). It is estimated that smoking prevalence in the region will increase by nearly 39% by 2030, from 15.8% in 2010 to 21.9 % by 2030. This is the largest expected regional increase globally (Blecher and Ross, 2013; Méndez *et al.*, 2013).

A recent analysis of the demand for cigarettes in 22 African countries which represent 80% of Africa's population, revealed that the demand for cigarettes has increased by 44% from 165.6 billion in 1990 to 238.5 billion cigarettes to 2012. This increased demand has been met by cigarette production increasing in these 22 countries by 106% during the same period. Production, however, exceeded demand necessitating Africa to export cigarettes. At the same time, cigarette production has become more concentrated as the tobacco industry has strategically identified certain countries as production hubs (Vellios *et al.*, 2018). Tobacco use prevalence varies greatly by age, sex and by country as summarized in Table 1.

TABLE 1: Prevalence of tobacco in Africa

Country	Youth		Adults		Smokeless
	Boys	Girls	Male	Female	
Algeria	1.73	0.42	17.5	2.2	5.7
Angola	0.6	0.31	14.2	1.6	1.4
Benin	0.43	0.14	8.6	1	5
Botswana	1.31	0.84	25.4	3.5	3.9
Burkina Faso	0.72	0.35	30.5	3.5	8.9
Burundi	0.39	0.13	9.7	0.9	9

Country	Youth		Adults		Smokeless
	Boys	Girls	Male	Female	
Cabo Verde	0.42	0.3	17.6	2.6	4.7
Cameroon	0.46	0.14	9.1	0.5	3
Central African Republic (CAR)	0.47	0.28	11.6	1.4	n/a
Chad	0.43	0.18	11.5	1.9	3.5
Comoros	0.58	0.24	19	4.3	5.4
Congo, DRC	0.55	0.11	14.1	0.9	9.7
Congo, Brazzaville	0.38	0.25	30.5	1.1	5.2
Cote d'Ivoire	0.42	0.16	14.2	1.4	1.2
Djibouti	1.44	0.4	21.6	2.8	n/a
Egypt	0.79	0.13	44.5	0.1	0.7
Equatorial Guinea	0.51	0.38	8.6	1.2	1.7
Eritrea	0.41	0.16	10.2	0.6	2.2
Eswatini (formerly Swaziland)	0.54	0.23	9.5	0.8	2.2
Ethiopia	0.2	0.08	6.2	0.2	0.8
Gabon	0.89	0.47	14.7	2.2	1.2
Gambia	1.35	0.13	19.3	0.8	1.1
Ghana	0.17	0.21	9.5	0.3	0.7
Guinea	0.65	0.25	6.9	1.4	1.4
Guinea-Bissau	0.9	0.18	11.4	1	n/a
Kenya	0.51	0.15	14.9	1	3.6
Lesotho	2.04	0.41	42.3	0.3	10.5
Liberia	0.24	0.1	21.4	1.7	2.1
Libya	0.62	0.27	24.8	0.4	1.2
Madagascar	0.77	0.26	19	0.15	22.1
Malawi	0.43	0.09	16.7	3	0.4
Mali	0.55	0.13	30.8	2.3	3.1
Mauritania	1.41	0.85	41.1	2.9	16.9
Mauritius	2.33	0.46	30.2	1.5	n/a

Country	Youth		Adults		Smokeless
	Boys	Girls	Male	Female	
Morocco	0.52	0.23	38.3	0.8	n/a
Mozambique	0.6	0.1	21.7	3.6	6.9
Namibia	1.42	1.21	29.6	7.8	2.1
Niger	0.48	0.21	13.4	0.1	3.5
Nigeria	0.17	0.06	13.7	0.8	1.9
Rwanda	0.53	0.14	12.4	3.8	2
Sao Tome and Principe	0.27	0.13	6.2	1	2.8
Senegal	0.54	0.22	9.7	0.3	0.7
Seychelles	1.09	0.66	33.9	6.4	0.3
Sierra Leone	0.74	0.26	44.1	7.9	7.5
Somalia	0.61	0.24	13.1	1.6	n/a
South Africa	1.68	0.81	26.5	5.5	6.8
South Sudan	0.63	0.24	13.3	1.7	n/a
Sudan	0.39	0.45	1.3	0.4	13.5
Tanzania	0.38	0.15	19.8	2.2	2.5
Togo	0.22	0.16	9.2	1.1	3.6
Tunisia	1.51	0.27	36.1	3	5.4
Uganda	0.69	0.43	9.8	1.3	3.7
Zambia	0.58	0.29	16	2.5	0.5
Zimbabwe	0.7	0.03	20.5	1.3	1

Source: *Tobacco Atlas, 6th Edition*

2.2 Tobacco and Sustainable Development

As incomes rise for a growing African population, tobacco use will double in the coming years if strong tobacco control measures are not implemented. There is a need to contextualize the socio-cultural issues of tobacco use in Africa, including the deep-rooted perceptions, norms and how they drive consumption.

It is known that tobacco is a threat to development because it is the world's number one cause of preventable death. Tobacco use affects many dimensions of development, including poverty, mental health, and premature mortality due to NCDs. These links can be seen through the references to tobacco use under the WHO FCTC, the Sustainable Development Goals (SDG) (WHO 2017a) and initiatives for Universal Health Care (UHC). The associations range from the impact of tobacco on morbidity and mortality to farming and environment, (WHO FCTC article 17&18) and MDGs targets (1, 2, 3, 4, 5, 13 & 17). Universal Health Care (UHC) provides a platform for a full spectrum of essential quality health care services spanning from promotion, prevention, treatment, rehabilitation and palliative care. The WHO FCTC further provides for surveillance/evaluations on information sharing (Article 20, 21, 22).

By current trends, the estimated population of Africa will increase from 1.2 billion in 2015 to 1.7 billion in 2030 and to 4.2 billion (or 40% of the world's population) in 2100, with the highest increase in East Africa and West Africa albeit low quality and less productive population (UNICEF 2014). Without appropriate tobacco control policies, including prevention strategies across the continent, Africa will lose millions of lives in this century due to tobacco smoking (Blecher and Ross 2013).

The net economic costs of tobacco are profoundly negative - costs of treatment, mortality and disability exceed estimates of the economic benefits to producers and consumers by at least 200 billion US dollars annually, with one third of this loss being incurred by developing countries. There are about 800 million smokers presently in developing countries, and the number is still increasing with half of the men and almost 10% of women in developing countries projected to smoke.

In addition, health conditions and lifestyle risk factors are associated with workplace productivity loss and reiterate the value of maintaining a healthy population (Mitchell and Bates, 2011). Each year, three million of the 30 million adult deaths in the world are attributable to tobacco. In terms of current smoking patterns, by about 2025, this annual number will rise to 10 million deaths, of which seven million will then be in developing countries. Additionally, each 1000 tonnes of tobacco production will eventually result in about 1 000 deaths;

At the Financing for Development Summit in Addis Ababa in 2015, world leaders and ministers of finance and development agreed that “price and tax measures on tobacco can be an effective and important means to reduce tobacco consumption and health care costs. They also represent a revenue stream for financing for development in many countries. Higher tobacco prices also discourage young people from starting to smoke, encourage smokers to quit and generate significant revenues. An earlier WHO report estimated that tobacco control can be put in place in Africa for a cost of just US\$0.11 per person per year (WHO 2011). Even that low number is an overestimate if you consider the revenue-generating potential

of one of the WHO FCTC's measures: notably, tobacco taxation. It is estimated that governments already collect nearly US\$ 270 billion in tobacco excise tax revenues each year (NCI Monograph 21), yet Africa lags behind HIC. In these countries, total tax as a proportion of the price of cigarettes varies greatly, on the other hand, taxes account for almost 65% of the price (WHO 2015a). Although the WHO FCTC and SDGs have emphasized the impact of raising tobacco taxes, most African countries have lagged in implementing this policy measure. The cost of inaction to tobacco use in Africa is projected to reach unmanageable levels in the next 10 years. There is a lack of an understanding the drivers to use of new and emerging tobacco products in Africa which will provide a clear direction of what policies and programmes are required in Africa.

2.3 Tobacco Use and Health

Discussions on tobacco use and control, and the situation analyses from Africa, Asia, and Latin America have noted that HIV and tobacco are the only two major underlying causes of premature death that are increasing substantially. The statistics are alarming. About 200 million children and teenagers will, on current smoking patterns, eventually be killed by tobacco use. The addiction usually starts before adult life. Smoking during pregnancy substantially reduces birth weight, and low birth weight is strongly associated with infant mortality and illness. Parental smoking increases the incidence of acute respiratory infections and asthma in children. Women and youth in developing countries are being targeted as a growth market for tobacco.

2.3.1 Tobacco use and Non-Communicable Diseases (NCDs)

Tobacco use is recognized as one of the main shared modifiable risk factors for non-communicable diseases and its reduction is one of the 6 objectives of the WHO 2008-2013 action plan for the global strategy for the prevention and control of NCDs. Tobacco causes great socioeconomic harm within all countries, particularly developing nations (Douglas Bettcher; Director, WHO Tobacco Free Initiative; third meeting of the human rights and tobacco).

The 2010 global Non-Communicable Diseases (NCDs) report showed that NCDs are the biggest cause of death worldwide (Marquez *et al.*, 2013). It states that more than 36 million people died from NCDs, mainly cardiovascular diseases (48%), cancers (21%), chronic respiratory diseases (12%) and diabetes (3%). Premature deaths from NCDs accounted for 22% among men and 35% among women in low-income countries (WHO 2012a). Tobacco use is associated with an increased risk of death from communicable diseases including tuberculosis, HIV and reproductive health complications including stillbirth, low birth

weight, congenital malformations, death attributed to sudden death syndrome in infancy. Tobacco use causes 1 in 6 NCD deaths. Table 2 presents the NCDs burden across Africa.

TABLE 2: NCDs in Africa

Country	Proportional Mortality of NCDs (%)							
	Cancers	Respiratory	Diabetes	Cardiovascular diseases	Communicable, maternal, perinatal and nutritional conditions	Injuries	Other NCDs	NCDs total deaths
Algeria	13	3	4	36	15	10	19	76
Angola	4	2	1	10	63	9	11	27
Benin	4	2	2	14	54	10	14	36
Botswana	7	4	6	18	46	8	10	46
Burkina Faso	5	2	1	13	56	11	12	33
Burundi	7	2	1	12	56	12	10	32
Cabo Verde	11	4	5	36	20	10	15	70
Cameroon	5	2	2	12	54	11	14	35
Central African Republic (CAR)	4	2	1	11	64	10	8	26
Chad	26	6	5	27	63	9	21	27
Comoros	8	2	2	17	47	11	12	42
Congo, DRC	5	2	1	10	62	10	10	28
Congo, Brazzaville	5	2	2	14	55	10	12	35
Cote d'Ivoire	4	2	2	15	52	10	14	37
Djibouti	7	2	2	19	45	10	14	44
Egypt	13	4	3	40	10	6	24	84
Equatorial Guinea	4	2	3	13	53	11	14	36
Eritrea	8	3	3	19	43	12	12	45
Eswatini (formerly Swaziland)	6	3	6	13	54	10	10	37
Ethiopia	7	2	2	16	49	12	12	39

Country	Proportional Mortality of NCDs (%)							
	Cancers	Respiratory	Diabetes	Cardiovascular diseases	Communicable, maternal, perinatal and nutritional conditions	Injuries	Other NCDs	NCDs total deaths
Gabon	5	2	3	17	50	9	14	41
Gambia	4	2	1	14	55	11	12	34
Ghana	5	2	3	19	48	10	13	43
Guinea	4	3	2	15	56	9	12	35
Guinea-Bissau	4	2	2	13	62	8	10	30
Kenya	10	1	1	8	63	10	8	27
Lesotho	4	4	4	14	59	8	7	32
Liberia	5	1	2	13	59	10	10	31
Libya	12	3	4	35	8	20	18	72
Madagascar	10	4	1	20	60	9	8	32
Malawi	10	2	1	10	60	9	9	32
Mali	4	3	1	12	61	9	10	30
Mauritania	5	2	2	16	53	9	13	37
Mauritius	12	9	24	33	6	5	11	89
Morocco	14	4	6	38	14	6	18	80
Mozambique	8	1	1	9	65	8	7	27
Namibia	5	4	4	17	49	10	10	41
Niger	3	2	1	11	63	10	10	27
Nigeria	4	2	1	11	63	8	12	29
Rwanda	13	3	2	14	42	14	13	44
Sao Tome and Principe	10	7	1	18	34	11	19	55
Senegal	6	3	2	17	46	12	13	42
Seychelles	18	4	3	34	12	7	22	81
Sierra Leone	3	2	2	14	58	9	12	33

Country	Proportional Mortality of NCDs (%)							
	Cancers	Respiratory	Diabetes	Cardiovascular diseases	Communicable, maternal, perinatal and nutritional conditions	Injuries	Other NCDs	NCDs total deaths
Somalia	4	1	1	10	64	12	8	24
South Africa	10	4	7	19	40	9	11	51
South Sudan	7	2	1	10	63	9	8	27
Sudan	6	3	2	28	35	13	12	52
Tanzania	7	2	2	13	56	11	10	33
Togo	5	3	2	16	52	11	12	38
Tunisia	12	4	5	44	8	6	21	86
Uganda	9	2	2	10	54	13	11	33
Zambia	6	2	1	10	61	10	10	29
Zimbabwe	7	2	3	11	55	12	10	33

Summarized from the WHO NCD Country Profile Report 2018.

2.3.2 Tobacco Use and HIV/AIDS

While the prevalence of cigarette smoking has declined in some regions, the proportion of people living with HIV who are smokers remains high and will double that in the general population (Diaz and Ferketich, 2018). Having HIV/AIDS is associated with a higher prevalence of smoking and poorer outcomes in HIV-associated opportunistic infections particularly poorer treatment and survival outcomes (Van Zyl Smit *et al.*, 2010). Rates of current smoking among people living with HIV (PLWHIV) are 2 to 3 times that of the general population, which contributes to the higher incidence of non-AIDS-related morbidity and mortality in PLWHIV (Giles *et al.*, 2018). While PLWHIV are more likely to smoke compared to HIV-uninfected counterparts, little is known about smoking behaviours in sub-Saharan Africa (Mitton *et al.*, 2018, Kruse *et al.*, 2014). Similar HIV-smoking relationships are less understood in low resource settings. The HIV-smoking relationship is understudied in sub-Saharan Africa, where tobacco use patterns and HIV prevalence differ greatly from other world regions.

Smokers living with HIV/AIDS lose more life-years than their non-smoking counterparts, likewise people living with HIV are 12% more likely to smoke and 34% more likely to use smokeless tobacco

than their HIV negative peers in Africa. Having HIV is associated with a greater likelihood of smoking cigarettes in sub-Saharan Africa (Murphy *et al.*, 2019). The excess mortality of smokers is tripled, and the population-attributable risk of death associated with use is doubled among HIV patients compared to the background population. Tobacco use weakens the immune system and makes it harder for the body to fight HIV related infections. It interferes with metabolism of drugs by the liver making liver functioning weaker. People with HIV/AIDS who smoke are more likely to develop several opportunistic infections such as oral thrush, oral leukoplakia, bacterial pneumonia and pneumocystis pneumonia than non-smokers (Helleberg *et al.* 2012).

2.3.3 Tobacco Use and Incidence of Tuberculosis

There is sufficient evidence to confirm the association between tobacco use and tuberculosis (TB) (WHO 2007). The WHO estimates that more than 20% of global TB incidence is attributable to tobacco use making tobacco a major risk factor for TB. Areas with high prevalence of smoking have been demonstrated to have equally high prevalence of active tuberculosis with phenomenal activation of latent TB. It is further estimated that tobacco use increases the risk of acquiring TB disease by more than two and a half times. A large population-based study in Taiwan reported that smoking doubles the risk of recurrent TB and recommended inclusion of effective smoking cessation measures in TB control programmes (Yen *et al.*, 2014).

2.3.4 Tobacco Use and Reproductive Health

Tobacco affects fertility in both men and women. A study by Weisberg (1985), reports that tobacco use reduces a woman's fertility. Women smokers tend to take longer to conceive than women who do not smoke, and women smokers are at a higher risk of not being able to get pregnant at all. Tobacco use during pregnancy increases the risk of spontaneous abortions, premature delivery, stillbirths, infertility, and having children with low birth weight. Tobacco contains nicotine and tar, the substances which affect blood vessels supplying the placenta, hence, leading to under nutrition of the foetus. Other complications include neonatal death, and long-term effects on surviving children including; long term disabilities such as cerebral palsy, intellectual disability, and learning problems. Women who smoke during pregnancy are more likely to have ectopic pregnancy, vaginal bleeding, placenta abruption, and placenta previa (Weisberg 1985).

Among men, studies have shown that those whose mothers smoked while pregnant are at risk of having smaller testes (Virtanen *et al.* 2012), lower mean sperm concentration and lower total sperm counts (Jensen *et al.* 2005). Men who smoke have a lower sperm count than non-smokers, and their semen contains a

higher proportion of malformed sperm, they experience erectile dysfunction and impotence (Ramlau-Hansen *et al.* 2006; Gaur, *et al.* 2007; Schilling *et al.* 2012, Harlev *et al.*, 2015).

Although Africa is still at the early stage of the tobacco epidemic (Lopez *et al.* 1994; Thun *et al.* 2012), the prevalence is on the increase among the youth (WHO Regional office for Africa, 2014). It is, therefore, imperative to invest in tobacco control (TC) to prevent a large-scale epidemic in Africa. With a high burden of communicable diseases, lack of control of the tobacco induced NCDs would water down the efforts on the communicable diseases and lead to a double tragedy. The consequences of the tobacco epidemic in Africa will be exacerbated by rapid population growth, which, although slowing, is among the highest in the world.

2.4 Gender, Human Rights and Tobacco

2.4.1 Gender and Tobacco

Tobacco exposure is disproportionate across different sections of society, and gender interacts with social class, occupation, age, indigenous ethnicity, geographical location, to reproduce and reinforce levels of risk; tobacco exposure is linked to notions of masculinity and changing notions of femininity; health system responses (access to care; quality of care received; gender of care-givers) are influenced by gender. Despite this, a large proportion of tobacco control research, and many tobacco control policies and programmes are gender-blind – thus missing a key determinant not only of risk, but of effective interventions.

Gender is an important determinant of health inequities in three interlinked domains: the intersection of gender and other social determinants of health; the impact of gender on health behaviours (protective or risky); and the gendered nature of health system responses. All three domains have relevance for tobacco control (Hawkes and Buse, 2018) notwithstanding requirements of equality, non-discrimination and accountability (Human rights based approach; www.who.int/hhr/en).

Although tobacco use has mainly been gender driven where more men than women use tobacco, the current trends are revealing a different dimension, where more women are now taking up tobacco use due to aggressive marketing by the tobacco industry. More women than men are however, exposed to second-hand smoke. This therefore calls for more gender context research to guide strategic programme and policy implementation in Africa.

2.4.2 Human Rights and Tobacco

Human rights became universally defined with the Universal Declaration of Human Rights (UDHR) in 1948, specifically noting the health and well-being of a person and their ability to access medical care and necessary social service (UDHR 1948). Human rights were established to protect fundamental values such as the ability to live, have a family and be free from cruel treatment. There are a plethora of universal declarations and international covenants, conventions and treaties that encourage civil and political rights, economic, social and cultural rights, the rights of the child and those that eliminate discrimination against women.

The WHO FCTC is derivative from previously constructed international human rights conventions. A human rights-based approach to tobacco control could provide new approaches to the effort. From the UDHR and the conventions that followed, the right to life, health, a healthy environment are some of the constructs that can be used as a basis for the right to tobacco control. This would impose a corresponding duty on the state to pursue various means of restricting tobacco use. Similarly, the dangers posed to non-smokers by second-hand smoke (SHS) can be construed as an infringement of the rights of a non-smoker. Active smoking claims over 7 million lives per year of who SHS is responsible for 890,000 death per year, largely women and children. Given these facts of active smoking and exposure to second-hand smoke, the basic rights to life and health are violated. The rights to life and health, recognised in the WHO FCTC, may therefore merit the further protection of individuals including children and women from active smoking and second-hand smoke exposure both which cause devastating health effects which lead to morbidity, disability and mortality.

It is though clear that the link between human rights and tobacco is still under-researched and therefore requires more effort to try and guide policy-makers on how to integrate human rights into tobacco control policies and programmes. The TCRA will also support efforts to integrate human rights framing of tobacco issues into advocacy efforts, in ways that recognize the legal frameworks for human rights in each country.

2.5 Tobacco Control Efforts in Africa

Forty-six African countries have signed and ratified the WHO FCTC and several of these countries have formulated and implemented TC policies. Thirty-five of 54 governments in Africa have national agencies for tobacco control, within which the number of staffs ranges from 0.5 to 58 full-time equivalents. Each African country has a tobacco control focal point in the Ministry of Health. A great majority have national multi-sectoral steering committees for tobacco control led by the Ministry of Health. They comprise

membership from other government ministries as well as civil society and academia. These positive signs notwithstanding, there remain some definite challenges for tobacco control in the region (WHO 2016). There are more than 70 African Non-Governmental Organizations in the Framework Convention Alliance actively engaged in tobacco control.

TABLE 3: African Parties to The WHO Framework Convention on Tobacco Control in Africa as of November 2019

Country	Date of signatory	Ratification, Acceptance(A), Approval (AA), Formal confirmation(c), Accession(a), Succession(d)
Algeria	20 Jun 2003	30 Jun 2006
Angola	29 Jun 2004	20 Sep 2007
Benin	18 Jun 2004	3 Nov 2005
Botswana	16 Jun 2003	31 Jan 2005
Burkina Faso	22 Dec 2003	31 Jul 2006
Burundi	16 Jun 2003	22 Nov 2005
Cabo Verde	17 Feb 2004	4 Oct 2005
Cameroon	13 May 2004	3 Feb 2006
Central African Republic (CAR)	29 Dec 2003	7 Nov 2005
Chad	22 Jun 2004	30 Jan 2006
Comoros	27 Feb 2004	24 Jan 2006
Congo, DRC	28 Jun 2004	28 Oct 2005
Congo, Brazzaville	23 Mar 2004	6 Feb 2007
Cote d'Ivoire	24 Jul 2003	13 Aug 2010
Djibouti	13 May 2004	31 Jul 2005
Egypt	17 Jun 2003	25 Feb 2005
Equatorial Guinea		17 Sep 2005 a
Eritrea**		
Eswatini (formerly Swaziland)	29 Jun 2004	13 Jan 2006
Ethiopia	25 Feb 2004	25 Mar 2014
Gabon	22 Aug 2003	20 Feb 2009
Gambia	16 Jun 2003	18 Sep 2007
Ghana	20 Jun 2003	29 Nov 2004

Country	Date of signatory	Ratification, Acceptance(A), Approval (AA), Formal confirmation(c), Accession(a), Succession(d)
Guinea	1 Apr 2004	7 Nov 2007
Guinea-Bissau**		7 Nov 2008 a
Kenya	25 Jun 2004	25 Jun 2004
Lesotho	23 Jun 2004	14 Jan 2005
Liberia	25 Jun 2004	15 Sep 2009
Libya	18 Jun 2004	7 Jun 2005
Madagascar	24 Sep 2003	22 Sep 2004
Malawi**		
Mali	23 Sep 2003	19 Oct 2005
Mauritania	24 Jun 2004	28 Oct 2005
Mauritius	17 Jun 2003	17 May 2004
Morocco	16 Apr 2004	
Mozambique	18 Jun 2003	14 Jul 2017
Namibia	29 Jan 2004	7 Nov 2005
Niger	28 Jun 2004	25 Aug 2005
Nigeria	28 Jun 2004	20 Oct 2005
Rwanda	2 Jun 2004	19 Oct 2005
Sao Tome and Principe	18 Jun 2004	12 Apr 2006
Senegal	19 Jun 2003	27 Jan 2005
Seychelles	11 Sep 2003	12 Nov 2003
Sierra Leone**		22 May 2009 a
Somalia**		
South Africa	16 Jun 2003	19 Apr 2005
South Sudan**		
Sudan	10 Jun 2004	31 Oct 2005
Tanzania	27 Jan 2004	30 Apr 2007
Togo	12 May 2004	15 Nov 2005

Country	Date of signatory	Ratification, Acceptance(A), Approval (AA), Formal confirmation(c), Accession(a), Succession(d)
Tunisia	22 Aug 2003	7 Jun 2010
Uganda	5 Mar 2004	20 Jun 2007
Zambia		23 May 2008 a
Zimbabwe		4 Dec 2014 a

NB: Eritrea, Malawi, Morocco, South Sudan, Somalia, Guinea Bissau, Equatorial Guinea are not yet Parties

Source: WHO FCTC Website, November 2019

The Global Tobacco Control Surveillance System has supported the continent and provided prevalence data. Currently over 25 African countries have adult and youth prevalence data (<https://www.cdc.gov/tobacco/global/gtss/index.htm>). Although there is progress in implementing tobacco control on the African continent, Africa lags behind other regions and there is weak policy implementation due to several challenges including: , i) limited political commitment, ii) meagre resource allocations, iii) limited evidence to drive policy implementation, iv) limited communication and advocacy for tobacco control v) disjointed platform for communicating, disseminating and sharing best practices on TC in Africa, vi) weak policy enforcement, and compliance due to low capacity, vii) weak coordination (Chung-Hall et al. 2018).

2.6 Tobacco Industry Influence in Policy implementation

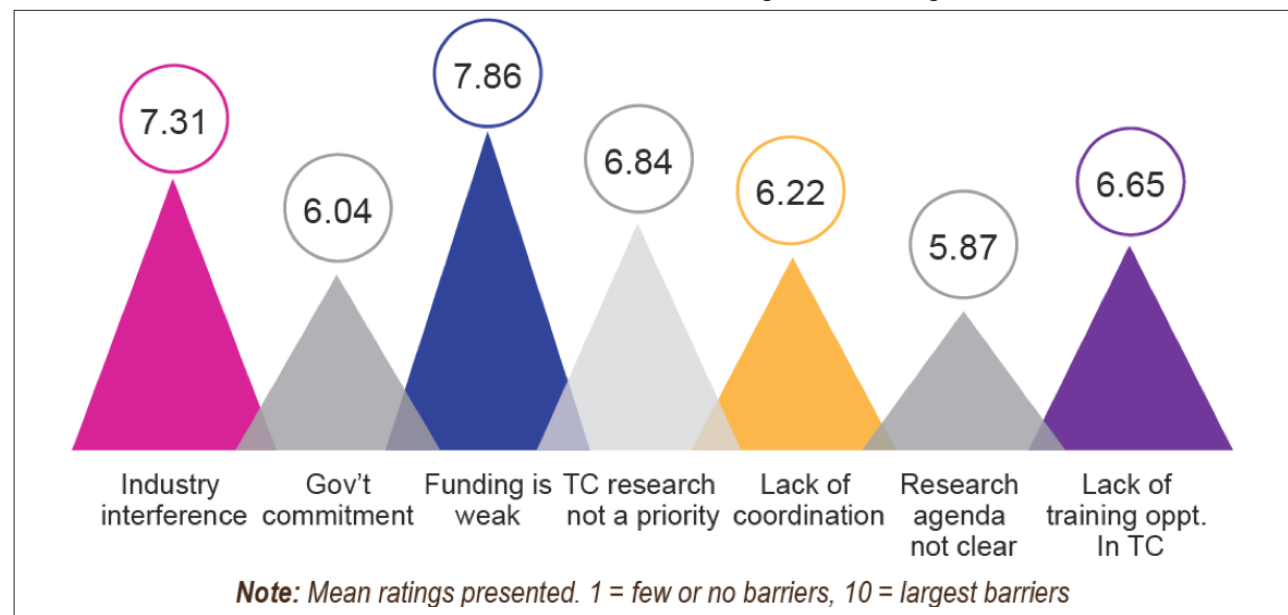
The Tobacco Industry (TI) has interfered in enactment and implementation of tobacco control legislation in Africa. This is manifested in the long processes most African countries take to enact tobacco control laws. For example, in Kenya it took close to 13 years to get the Tobacco Control legislation through parliament, before it was finally passed and enacted into law in 2007. In Uganda, it took eight years to get a Tobacco Control Act since ratification of the WHO FCTC. This environment is similar to many African countries, where the TI influences politicians and intimidates policy makers, hence delays in the process of enactment and or weaken the resultant laws. TI interference as elaborated above needs to be monitored and properly countered if public health advocates and governments are to succeed in effectively implementing the WHO FCTC. Currently, among the countries that have ratified the WHO FCTC in the WHO Afro region, a few have domesticated the treaty, mainly because of the influence of the tobacco industry. A recent investigation revealed tobacco industry interference in the legislative process including buying politicians, MPs and advocates (Gilmore *et al.*, 2015).

2.7 Existing Research in Africa

In a drive to understand the needs of stakeholders working in tobacco related projects in Africa, an online survey in English, French and Arabic was done to gain insights in the work and research being conducted, the barriers to tobacco control efforts and to identify individuals and agencies in the collaboration. Overall 219 respondents from 37 countries were interviewed and a review of 818 peer reviewed articles done to provide context. The review identified gaps and country variations in the implementation of MPOWER measures with main barriers. These barriers were: (1) Monitor tobacco use and prevention, article 20, (2) Raising taxes on tobacco, articles 6 and 15, (3) Industry interference, article 5.3, (4) Offer health to quit tobacco use, article 14, and (5) Protect people from tobacco smoke, article 8, (Okamoto *et al.*, 2019). Few respondents reported conducting research on these topics (36.5%–21.0%).

The barriers were measured using a mean rating of 1 being the smallest barrier to 10 being the largest. The survey found that barriers, in order of most significant to smallest, were weak funding (7.86), industry interference (7.31), tobacco control research not being a priority (6.84), lack of training opportunities in tobacco control (6.65), lack of coordination (6.22), government commitment (6.04), and an unclear Africa Research Agenda (5.87) (Figure 2).

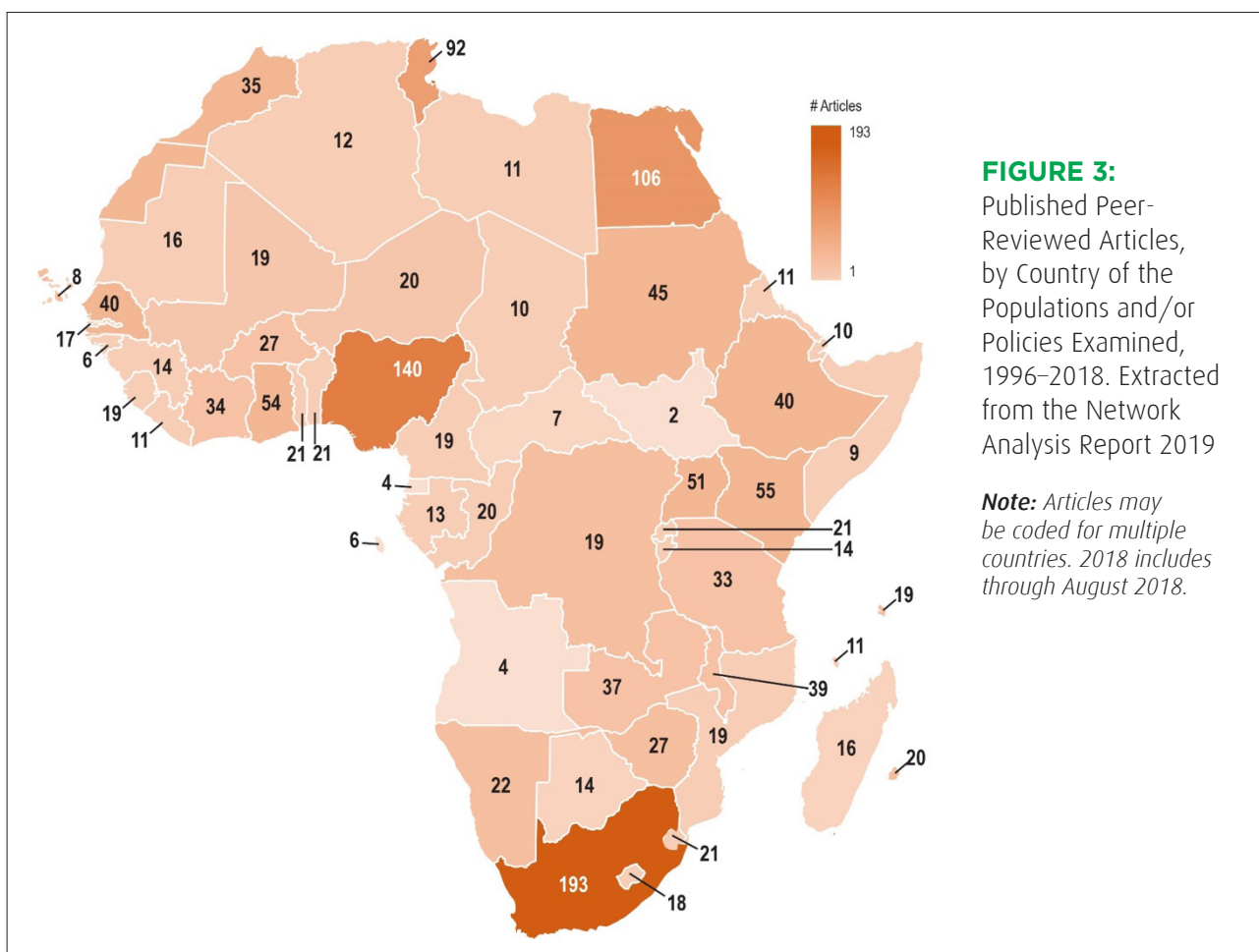
FIGURE 2: The barriers to tobacco control efforts measured using a mean rating



Health research capacity and focus varies significantly within the region generally. Also, some of the most relevant capacities for tobacco control research may be different than those used for health research more generally. An analysis based on a health research barometer tool showed an average capacity of only 42.3% in the region, ranging from 6% to 81% amongst the countries (Kirigia *et al.*, 2016). Capacities vary in areas of action, with gaps seen in management capabilities, research governance or technical research skills (WHO 2015c). Africa's percentage share of global health research output was 0.7% in 2000 and increased to 1.3% in 2014. The research arena in the African Region is characterized by a multiplicity of actors, dispersed efforts and unclear results in relation to impact on priority health problems including NCDs and tobacco (WHO 2015c).

An evaluation of peer-reviewed research published on tobacco control topics spanned more than twenty years and showed a growing number of publications (n=818) with all African countries represented in one or more publications. Much of tobacco control research in Africa was focused on populations or policies in South Africa (23.6%), Nigeria (17.1%), Egypt (13.0%), and Tunisia (11.2%) (Figure 3). Most articles focused on studying tobacco use behaviour including tobacco use patterns (52.9%), potential determinants of use (32.8%), and tobacco-related knowledge and beliefs (24.4%). The findings suggest that there are opportunities for additional research on tobacco control policies and programs leveraging lessons learned from high-income countries.

The capacity for health research in the region is low owing to a weak health research system. In a WHO survey of the NHRS of the 47 countries in April 2014, 24 (51%) had no national health research policy; 27 (57%) were without law governing health research; 25 (53%) lacked a strategic health research plan; 22 (47%) had no health research agenda; 21 (45%) were without a national health research institute/council; and 25 (53%) lacked a dedicated budget to support research in their ministries of health. Priority is not given to research as a tool for solving the Region's health needs, and investments in health research are therefore insufficient. It will be pivotal if the TCRA is prioritized by the academia and other specialised research agency to support teaching, efforts for policy adoption and implementation to upscale implementation science thus bridging the gap in policy implementation.



Most research activities are driven by external partners with agendas that do not often address national health priorities. Only 3.8% of new medicines approved between 2000 and 2011 are for diseases that disproportionately affect the Region. The sharing and utilization of research results in our Region is weak. Knowledge translation platforms that link researchers and policymakers, such as Evidence Informed Policy Networks (EVIPNet) launched since 2006 by WHO, exist in only 12 (26%) countries in the African Region. Therefore, the majority of countries have not embraced platforms that enhance the translation of research outputs into health policies and services.

Many countries are facing significant challenges in training and retaining researchers. The training curriculum of health professionals is weak in research, the career path for researchers is ill-defined, and

incentives for researchers are poor. Consequently, only a small proportion of graduate's express interest in research careers, leading to an inadequate base of qualified researchers. The most recently developed health research priorities for Africa by the *African Advisory Committee on Health Research and Development (AACHRD)* have identified as priority areas: tobacco use, youth and tobacco use, tobacco control in emergency situations, social and environmental determinants of tobacco control, and cost effectiveness of managing NCDs. This provides a basis for further developing a research agenda on tobacco control to expound on the identified areas. Additionally, New Partnership for Africa's Development (NEPAD) has identified Africa research areas in relation to economic development, which include health and development, with a specific on SDGs, investment in health and public private partnerships in health. The research agenda on TC control is aligned to the existing research priorities identified by the African Advisory Committee on Health Research and Development (AACHRD) and NEPAD and CTCA will collaborate with these bodies in the implementation of the TCRA.

3

STRATEGIC DIRECTION OF THE RESEARCH AGENDA

The vision, mission, and goal of the Tobacco Control Research Agenda are based on the significant tobacco issues in Africa. The agenda's strategic direction is, therefore, crafted along the strategic direction of the CTCA as the coordinating institution for the agenda.

MISSION

Conduct research to inform evidence-based tobacco control policies and programmes and advocacy initiatives in Africa.

GOAL

To provide a guide for generating local evidence to drive tobacco control policy formulation and implementation in Africa by 2025.

OBJECTIVES

The specific objectives of the TCRA are;

- (i) To provide at least eight priority research themes on tobacco control in Africa in the seven years of the CTCA strategic plan.

- (ii) To provide a strategy to strengthen research capacity in Africa for tobacco control stakeholders by the end of the project period
- (iii) To guide multidisciplinary and collaboration through at least two rounds of call for research applications from tobacco control research actors in Africa in seven years
- (iv) To guide resource mobilization to sufficiently finance ten projects for tobacco control research in Africa in seven years

GUIDING PRINCIPLES

The implementation of the research agenda will be guided by the following principles;

Political will and commitment: Undertaking meaningful research at national and regional level requires adequate resources, which will be sourced both domestically and externally.

Demand driven: Research stakeholders shall be encouraged to conduct research responsive to priority themes and questions.

Ethics, Human Rights and Law: The dignity and rights of all research participants including vulnerable populations shall be promoted and protected as enshrined in the bioethics principles, and the research laws and guidelines in the respective countries and at regional and international levels.

Networking, Partnerships and Collaboration: Strategic partnerships with public and private research institutions and with a cross-section of other stakeholders shall be established, strengthened, and promoted.

Sensitivity to gender issues and needs: Encouragement of fair participation of both genders and vulnerable populations in research taking shall be promoted and encouraged.

Transparency: Undertake nonbiased research with all-inclusiveness, equal access and openness to stakeholders to inform policy and programming as well as provide feedback.

HOW THE RESEARCH AGENDA WILL BE USED

The TCRA is targeted at researchers, research funding agencies, policy makers, private institutions and advocates. It will provide a basis to:

- (i)** Develop research proposals that align with the identified research priorities,
- (ii)** Give direction to research institutions, medical institutions, private research institutions and individual researchers, with the expectation of providing African contextualized evidence for driving tobacco control policy enactment and implementation. The initial steps will include mapping of potential stakeholders across the TCRA priority domains,
- (iii)** Inform research agendas for governments and other research institutions hence increase their research efforts on tobacco control. This is in anticipation that the Africa TCRA will arouse interest for research and research financing,
- (iv)** Understand the existing research capacity and building stronger and more strategic research partnerships,
- (v)** Guide the annual review conducted by the CTCA and the TWG,
- (vi)** Facilitate the training of researchers with interest in tobacco control in Africa through educational and mentoring programs,
- (vii)** Support translation of research into policy through information dissemination platforms to all the different audiences,
- (viii)** Inform country needs and priorities through continuous reviews and evaluation of the research needs.

IMPLEMENTING THE RESEARCH AGENDA

CTCA will be responsible for successfully operationalizing and implementing the TCRA, through the following activities;

- a) Identifying and establishing strategic partnerships,
- b) Establishing an e-learning center to disseminate tobacco-related information,
- c) Facilitating and enhancing interagency collaboration,
- d) Mobilizing resources to implement the agenda,
- e) Conducting and communicating the results of the research agenda, and
- f) Evaluating, assessing progress and revising the TCRA.

This will be done with support from a technical working group (TWG), as well as the coordination, dissemination, editorial and advisory and grants review teams. These teams will comprise of technical

experts from multi-sectoral and multi-disciplinary areas and institutions. The TWG will provide technical guidance to the CTCA. Specifically, the TWG will be charged with; disseminating the TCRA, conducting annual reviews, communicating the results of the TCRA and supporting with resource mobilization for the TCRA. On the other hand, the Grants Review Team will be charged with overseeing the granting process including; issuing requests, reviewing the applications and supervision of the process. The Advisory Team will be comprised of experts from Africa and globally.

The research agenda will be implemented collaboratively through a networking arrangement. This, it is hoped, will increase ownership and use of the agenda, build capacity and encourage the dissemination and financing of the research agenda. CTCA will ensure stakeholders are involved at implementation, review, coordination and utilization. In addition, the Center will be responsible for mobilizing required resources for coordinating implementation and ensure widespread utilization of the results.

The Center will provide information to the stakeholders through agreed means and facilitate identification, prioritization and implementation of research activities through the partnerships developed. A mapping of potential partners and stakeholders including universities and/or consortium of universities, private research institutions, government sectors and agencies, disease focused organizations, Centers of Excellence on NCDs, Public health organizations, professional societies and private organizations will be done to guide creation of sustainable strategic partnerships.

The Center will then reach out to the potential collaborators and interest them in the TCRA. Collaborations will focus on activities including; joint research implementation and financing, capacity building, resource mobilization, jointly hosting conferences, joint publications, sharing databases, M&E, disseminating and communicating the results of the TCRA. In addition, CTCA will coordinate and support the development of tools, materials for research. Collaboration and partnerships will facilitate researchers to address complex research issues; increase learning and productivity in research; reduce research costs and increase intellectual companionship. Mode of operations for the collaborations will be through Memorandums of Understanding (MOU) and agreements.

MONITORING AND EVALUATION

The Center will manage the monitoring and evaluation function of the agenda as part of its institutional monitoring and evaluation. Key monitoring and evaluation functions will include annual reviews, midterm and end-term evaluations, continuous issues-based inquiry and surveillance.

RISK ASSESSMENT AND MITIGATION FRAMEWORK

Potential risks to the implementation of the Research Agenda have been identified and mitigating measures have been prescribed. The key risks include; tobacco industry interference, financing of the Research Agenda, variation in focus and loyalty among networks and stakeholder's tobacco control scoring low on the development agenda for many African countries, sociocultural values, and lead times from tobacco use to effects. A scoring system for tobacco control in Africa that can guide this Tobacco Control Research Agenda will be developed as part of its operationalization (L Joossens, M Raw; 2006).

CAPACITY BUILDING

Effective implementation of the identified research priorities requires strong, well-resourced and equipped multi-disciplinary/multi-sectoral research teams at national and regional levels. However, the current research capacity in Africa is inadequate to deliver the Tobacco Control Research Agenda. To effectively implement the Tobacco Control Research Agenda, research capacity should be developed at individual and institutional levels.

DISSEMINATING AND COMMUNICATING THE RESULTS OF THE RESEARCH

The CTCA will coordinate the dissemination and communication of research results and outputs through existing dissemination platforms such as the Africa Tobacco Control Webinar Series, websites, and social media platforms, World No Tobacco Day, conferences and existing journals. CTCA in collaboration with existing journals for instance the African Tobacco Control Research Journal (open access) will ensure TC research is prioritized to increase utilization. Furthermore, CTCA will work with the journals to create a tobacco control policy agenda to increase publications, which will accelerate implementation. Working through the TWG, CTCA will convene bi-annual meetings of the TWG to review existing materials for dissemination.

CTCA will establish an e-learning center for capacity enhancement. The Africa Tobacco Control Learning Center (ATCLC) will provide a platform for learning, training, and exchange of information. The learning center will be established and run as a unit within CTCA. The learning center will be a processing unit for research with the following components; e-learning platform, dissemination platforms and databases.

This model center will collect, store and make available country and regional level information, host online databases and avail research equipment. The center will develop a plan to operationalize the e-learning center. The resource mobilisation strands will include (a) a levy on short courses (b) African tobacco control conferences (c) subscription fees to the Africa tobacco control Journal (d) and (e) grants solicitation.



PRIORITY RESEARCH AREAS

Tobacco control research priorities are clustered into themes that will generate the needed evidence to drive tobacco control research. The criteria for identifying research priorities included (i) the significance in influencing tobacco control implementation in Africa (ii) gaps in existing research efforts, (iii) existing funding sources, (iv) the feasibility of doing the research, (iv) the level of WHO FCTC implementation and (v) the drive to link policy to implementation.



Research Agenda Priority setting session

There is increasing evidence that where one lives determines his/her health and behaviour including regard for those one interacts with. Thus, with varying social cultural and economic considerations, in such a diverse region as Africa, the 2nd largest continent in the world, there is need for spatial analysis and investigation into neighbourhood factors. The TCRA identifies eight key and central research priority themes;

1. Patterns, trends and inequalities of tobacco use and exposure for all tobacco products including the new products at country and regional levels (sex, age, region, types of products, new/emerging products)
2. Effects of tobacco use and exposure, and sustainable development (poverty, education, culture, HIV, TB, reproductive health, NCDs)
3. Tobacco use and populations at risk (youth, young adults, women/gender, elderly, residents of urban areas, military, prisoners, mental health patients, populations in low socio-economic duelling's like slums)
4. Policy analysis and implementation research (smoke free, TAPS, GHWs, cessation) cost effectiveness, impact, drivers, enablers, innovation, challenges, communication and advocacy)
5. Sociocultural context of tobacco use
6. Tobacco industry and tobacco control policy
7. Tobacco production, alternative livelihoods, and environment (distribution, food security, value chain, environmental impact, historical and determinants of tobacco production)
8. The economics of tobacco and tobacco control (product, pricing, illicit trade, tobacco trade and taxation)

4.1 Description of the priority research areas

Priority research areas are detailed under each theme and will be implemented in a phased manner.

PHASE I: TOBACCO USE EPIDEMIOLOGY AND POLICY

1. **Patterns and trends of tobacco use and exposure for all tobacco products including the new products at country and regional levels (sex, age, region, types of products, new products)**

Currently, tobacco use prevalence is obtained through population-based surveys such as the Global Tobacco Surveillance System, Demographic and Health Surveys, and National Housing Surveys. Under GTSS, tobacco prevalence data is collected through four surveys: The Global Youth

Tobacco Survey (GYTS); Global School Personnel Survey (GSPS); Global Health Professions Student Survey (GHPSS) and Global Adult Tobacco Survey (GATS). GYTS focuses on youth aged 13-15 and collects information in schools. GSPS surveys teachers and administrators from the same schools that participate in the GYTS. GHPSS focuses on 3rd year students pursuing degrees in dentistry, medicine, nursing and pharmacy. GATS is a nationally representative household survey that monitors tobacco use among adults aged 15 years and older. Although a good number of African countries have received support to conduct the 4 surveys, many are still not covered due to cost, where most African countries cannot afford. Several countries have outdated data. For the youth data the coverage in terms of countries is reducing, and its only school based, with the big and increasing youth population in Africa, prevalence data in this special population is more than critical to guide in defining the tobacco landscape and needs, identifying opportunities for prevention and control, and developing population-based programs and policies (Ahluwalia *et al.*, 2016).

The second data set that exists is the policy evaluation dataset by the International Tobacco Control Policy Evaluation Project (ITC), which is a tightly controlled dataset (<https://www.itcproject.org/>). The TCRA will explore opportunities of working in collaboration as ITC is increasingly looking at new products. Therefore, there is need to monitor the use of new tobacco products, tobacco industry influence and other many areas that are not monitored in the two datasets. In addition, there are many key variables that are missing in the two key data sets that would be important to guide policy implementation in Africa. In Africa, recent trends show an increase in tobacco use among girls, with 13% of young adolescent girls using tobacco products. Thirteen million women use tobacco products, including chewing tobacco and snuff. Recent estimates have shown the prevalence rate among girls to be between (4.6% and 36.6%) and for boys (7.8% and 45%). There is varying information on the prevalence in the different African regions and general prevalence at the continent level. In addition, little is known on the prevalence patterns. The research needs to address the following knowledge gaps include:

- (i)** Current incidence, prevalence and trends by age, sex, regions of tobacco related diseases,
- (ii)** Surveillance to understand the tobacco use epidemic and shifting epidemic from HIC to LMIC,
- (iii)** Driving factors of tobacco use in Africa,
- (iv)** Changing patterns of tobacco use in Africa,
- (v)** Mapping new and emerging tobacco products in Africa- patterns, trends, contents, potential effects of the new products, who is the most at risk and the motivation factors for the use of new and emerging tobacco products,

- (vi) Link between use of new tobacco products and other substances (e.g. alcohol, cannabis, aviation fuel),
- (vii) Marketing strategies and plans, supply chain, of new tobacco products.

2. Effects of tobacco use and exposure on sustainable development (poverty, education, culture, food security, environment, HIV, TB, reproductive health, NCDs)

The World Health Organization’s Framework Convention on Tobacco Control (WHO FCTC), an evidenced based treaty negotiated under the auspices of WHO, is a multilateral instrument, which provides a comprehensive response to the global tobacco epidemic. The multisectoral nature of the Convention and its implementation mechanism requires coordination across government ministries or departments as one of the primary requirements.

This includes setting up a multi-sectoral coordination mechanism at the national level. This particular obligation under the Convention has the potential to translate the “whole of Government approach” towards successful alignment and harmonization of treaty implementation as part of national health and development policies and programmes. Most recently tobacco control was included in the Sustainable Development Goals, target 3.a, which is an important milestone for the implementation of the WHO FCTC. Giving tobacco control priority in the SDGs, was due the overwhelming evidence on the health, social, economic and environmental impacts of tobacco use on individuals, communities and countries (UNDP 2016a; UNDP 2017). However, inclusion of FCTC into the SDGs, does not guarantee implementation. There is need for a more coherent integration of tobacco control in development planning, governance and financing.

Without adequate investment in tobacco control, it is estimated that up to 1 billion people could die from tobacco related diseases in this century. The cost of health care due to tobacco use is high and the environmental impacts including deforestation, soil degradation, water, soil and air pollution effects are equally high (Small *et al.*, 2017). To increase the integration of tobacco control in development agendas and vice versa, the African continent requires evidence to drive the low momentum which is critically missing. The knowledge gaps to support tobacco control and sustainable development include;

- (i) Assessing the economic, environmental and health impact of tobacco use,
- (ii) Assessing the effects of tobacco use on poverty, education, culture, environment, HIV, TB, reproductive health, NCDs and other industrial products,
- (iii) Studies on food security in the tobacco growing regions,

- (iv) Understanding the interaction between tobacco use and communicable diseases such as HIV, TB,
- (v) Linking tobacco use with other substance abuse,
- (vi) Assessing the relationship between tobacco use and other industrial products such as alcohol, and sugars,
- (vii) Models for integrating prevention and control of tobacco use and NCDs.

3. Tobacco use and populations at risk (youth, young adults, women/gender, elderly, residents of urban areas, military, prisoners, mental health patients, populations in low socio-economic dwellings like slums)

Tobacco use trends in Africa are increasingly changing due to social, economic and demographic characteristics of tobacco users. Globally, evidence shows a transition in the tobacco use patterns, where tobacco use prevalence is increasingly becoming a behaviour affecting certain populations such as the female youth, mental health patients, military, and the poor (Bondurant and Wedge, 2009). In Africa this transition has been noticed, although there is lack of data/evidence on the prevalence and behaviour of these special populations. Tobacco use in targeted population segments has not been fully characterised therefore this TCRA will prioritise this segment of research.

There is need to disaggregate data based on the special groups such as the youth, hence provision of evidence-based tobacco control programs to support prevention and treatment programs for the special populations. There is anecdotal evidence that has shown high prevalence of tobacco use in mental health patients, and among individuals who are alcoholic and those who abuse substances. Similarly, smoking prevalence estimates are high among the military and police and among the confined populations such as prisoners (Drope *et al.*, 2018). However, there is no tobacco use data among these populations. Groups such as the poor, those with the low education, those with mental health and substance abuse co-morbidities, members of the military and police, and certain racial and ethnic groups smoke at significantly higher rates and/or experience markedly higher rates of tobacco-caused illness and death.

Finally, the tobacco product landscape and patterns of use have also changed over the last 50 years, with the evolution of poly-tobacco use and the emergence of new classes of tobacco products including electronic nicotine delivery systems (ENDS) such as e-cigarettes and e-cigars, and so-called modified risk products.

The available data has identified specific characteristics linked to tobacco use but has not provided data on tobacco use prevalence for all groups disproportionately affected by tobacco use in Africa. There is need for data on tobacco use for all the special populations. The information could spark new insights for current and future programmatic efforts, to address disparities in tobacco use, and provide baseline data for any future efforts that target tobacco-related disparities. Additionally, there are current practices that undermine the implementation of tobacco control policies in Africa for example prescribing cigarettes to mental health patients, which requires proper documentation and more so the need to assess the few tobacco control interventions and programs in Africa that are targeting these special population segments. The knowledge gaps that require further research include;

- (i) Effectiveness of tobacco control interventions in specific sociodemographic groups in Africa,
- (ii) Interventional studies to reduce tobacco and substance use among the youth (cohorts),
- (iii) Social-economic and environmental determinates of tobacco use among special populations in Africa,
- (iv) Effective strategies and approaches for enhancing youth participation in tobacco control policy implementation,
- (v) Models for tobacco use and poverty-inequality,
- (vi) Epidemiology of tobacco use among special populations in Africa (youth, armed forces, poor, mental health and LGBT) in Africa,
- (vii) Risk factors for smoking acquisition and cessation among special populations such as the youth.

PHASE II: TOBACCO USE EFFECTS AND CONTEXTS

4. Tobacco control policy research and analysis (smoke free, TAPS, GHWs, cessation) of cost effectiveness, impact, drivers, enablers, innovation, challenges, communication and advocacy for tobacco control

Over the ten years of the WHO FCTC implementation, Africa is still the weakest in Tobacco Control Policy formulation, adoption and implementation. Therefore, it's imperative to conduct a detailed content analysis for the tobacco policies in Africa after 10 years of the WHO FCTC using policy analysis frameworks that are contextually relevant for Africa. This help assess level of engagement of other sectors into tobacco, integration of the WHO FCTC into development

plans for the parties. There is need to do a comprehensive political economy analysis for tobacco control policy environment in Africa to assess the political economy challenges and barriers to implementing tobacco control policies and how they can be addressed (Bump and Reich, 2013). This will support the policy makers understand the political and economic dynamics of policy adoption, and implementation in Africa.

There is need to understand how the political economy analysis evidence would propel a public health driven agenda. Tobacco control requires multisectoral governance, however the African region is still grappling with this huge challenge and if this is not addressed tobacco control policy implementation will remain a fallacy (UNDP 2016b). The WHO FCTC acknowledges that most well-proven tobacco control measures require the meaningful engagement of sectors beyond health, such as finance, tax, justice, agriculture, trade, labour, education, youth and others. Although ministries of health officials are the lead for implementing the WHO FCTC, they need to integrate other sectors and provide a favourable environment to coordinate other sectors and stakeholders and this is still a very big challenge in Africa. Integrating tobacco control with other development programs/agenda is still lacking.

In Africa, there are a few robust national programs on tobacco control, with solid governance structures, financing and well-designed running programmes. Critical areas such as tobacco control communication is not funded, with almost no well-designed comprehensive communications campaign funded on the continent and yet the communications domain is central in driving public health epidemics down. Additionally, the tobacco control advocacy is still weak, with few civil society organizations (CSOs) involved and they also have limited funding, with no proper capacity building advocacy programmes contextualized to the continent. The CSOs are important in driving policy implementation, especially when they hold governments accountable to check the governance of the tobacco control programmes. The knowledge gaps that require evidence under this area include;

- (i)** Cost-effectiveness of each tobacco control policy strategy and intervention to form basis for prioritization (SF, TAPS, Taxation, GHWs, communication, advocacy, cessation) at national and regional levels,
- (ii)** The politics of tobacco control in Africa and its impact on policy adoption and implementation,
- (iii)** Impact of TC policies, regulations, and interventions in Africa,
- (iv)** Knowledge, perception, practice and capacity of policy makers to deliver tobacco control programmes in Africa,
- (v)** Understanding public support for the different tobacco control measures in African countries,

- (vi) Tobacco control policy implementation linkages with other development areas such as NCDs, air pollution and overall sustainable development,
- (vii) Evidence-based models/strategies to integrate tobacco control into the health care system,
- (viii) Assessment of how socio-cultural determinates of tobacco use impact tobacco control programming.

5. Sociocultural context of tobacco use

Traditionally, tobacco use has deeply rooted connections with society. While not documented, working with communities and traditions, tobacco is used as one of the items to sooth marriage and in some societies to stimulate libido while in others it's used as an inhibitory substance to libido. Either way, it is used, nicotine, the active ingredient in tobacco, is absorbed in the body with attendant irritation and tobacco related ill-health. Research is needed to:

- (i) Understand and document the cultural values attached to tobacco, tobacco use practice and effects,
- (ii) Behavioural patterns and influence on tobacco use,
- (iii) Transcultural considerations and effects of tobacco,
- (iv) Social cultural constructs and tobacco economics,
- (v) Transcendence of tobacco use and dependence,
- (vi) Effects of culture on tobacco control programming,
- (vii) Link between culture, tobacco growing and the environment.

6. Tobacco industry and tobacco control policy

After the Article 5.3 Guidelines were adopted in 2008, Parties were provided with the much-needed guidance to articulate the measures needed to protect health policies from tobacco industry interference. Article 5.3 covered various means of protecting policies such as by requiring transparency from the tobacco industry, rejecting partnerships, de-normalizing so-called corporate social responsibility (CSR) activities, raising awareness of tobacco industry tactics, strengthened code of conduct (avoiding conflicts and limiting interactions), and refusing any preferential treatment for the tobacco industry (WHO 2013).

Although Parties are required to use these guidelines in the development of tobacco control policies, most countries in Africa have weak policies on implementing Article 5.3 of the WHO FCTC. This is due to capacity issues and influence of the tobacco industry into the policy enactment process.

The tobacco industry interference has existed for years with the intention of subverting the role of governments and tobacco advocates implementing public health policies to combat the tobacco epidemic. Recent findings by University of Bath on tobacco industry interference in the legislative processes of several countries including Kenya, Rwanda, South Africa and Uganda, revealed tobacco industry interference in the legislative process including buying politicians, MPs and advocates (Gilmore *et al.*, 2015).

While there is some evidence of TI interference in tobacco control policy implementation, the magnitude and impact of the interference is not well documented in Africa. There is little or no documentation on the implementation of Article 5.3 in Africa, and where the implementation has happened there is no evidence on the impact and more so the nature, form and extent of influence. Additionally, there is no proper documentation of the nature of interaction between the tobacco industry and the tobacco control policy makers and advocates. The research needed to address the knowledge gaps includes;

- (i)** Trucking implementation of Article 5.3 in Africa,
- (ii)** Economic estimation of the cost of tobacco industry interference and its implications to the national economies in African countries,
- (iii)** Capacity of African governments to respond effectively to tobacco industry interference,
- (iv)** Effectiveness of media campaigns on tobacco in countering industry interference,
- (v)** Interaction of TI and TC policy and impact of TC policies on the tobacco business,
- (vi)** Impact of TI influence on tobacco farming including efforts to understand industry relationships with farmers and ways to incentivize crops substitution,
- (vii)** Nature, form and type of cooperate social responsibility,
- (viii)** Tobacco industry business practices and tax evasion and avoidance (licensing, sister companies/subsidiaries,
- (ix)** Drivers and factors of tobacco industry investment decisions,
- (x)** Understanding the anti-tobacco marketing; messaging efficacy, innovative communication, and tobacco industry marketing strategies to inform counter responses.

PHASE III: TOBACCO ECONOMICS

7. Tobacco production, alternative livelihoods and environment (distribution, value chain, environmental impact, historical and determinants of tobacco production)

While there is work done and knowledge on the economics of tobacco growing across Africa, on the profitability of tobacco farming, value chains, as well as costs of crop substitution, it not widely known or coordinated for effective dissemination and use. There is need to understand the incentives for transitioning to economically viable alternatives and the impact of tobacco production on farming households as well as the countries that grow tobacco. Research is needed on the adverse health and economic effects of tobacco growing on the farmers.

It is widely acknowledged that growing tobacco negatively affects the environment (CTCA 2012; Kibwage *et al.*, 2009). A literature review published in 2012 showed that tobacco farming, particularly in low- and middle-income countries, leads to deforestation and soil erosion because of the clearing of land for tobacco farming and curing, and the pollution of rivers and streams with agrochemicals such as pesticides and fertilizers that are used extensively (Arcury and Quandt, 2006; Mangora, 2005). These in turn lead to ecological disruptions. Although the WHO FCTC has been in place for more than 10 years, there is limited political will and research to support policy implementation. This research area will focus on the supply side of tobacco with specific focus on Articles 17 & 18 of the WHO FCTC and the research needed to address the knowledge gaps include:

- (i) Historical pathways and determinants of tobacco production,
- (ii) Impact of tobacco farming on the environment, including soil and water quality, and erosion,
- (iii) Supply and value chain for viable alternatives, which includes market (e.g., potential buyers) and profitability analysis in different regions,
- (iv) Economic and social impact of crop substitution; controlled experiments on input programs, credit programs and market enhancements,
- (v) Effects of tobacco farming on the health of farmers.

8. The economics of tobacco and tobacco control (product, pricing, illicit, tobacco, trade, taxation).

Tobacco use burdens national economies with more than US\$ 2 trillion (PPP) in health care costs and lost productivity annually, which is equivalent in magnitude to 1.8% of the world's annual gross domestic product (GDP) and 40% of this cost occurs in developing countries (NCI and WHO

2016). Today the economic burdens of tobacco pose enormous challenges in Sub-Saharan Africa, exacerbated by the aggressive marketing of the tobacco industry, the introduction of the new tobacco products, and generally very weak regulatory frameworks. The economics of tobacco and tobacco control is a broad and far-reaching discipline that has implications far beyond the realm of public health. Covering topics as broad as the relationship between tobacco use and poverty, licit and illicit trade flows, taxation of tobacco products, and the economic burden of tobacco-inflicted disease, the economics of tobacco control sits at the core of development (NCI and WHO 2016).

The WHO FCTC Article 6 provides guidance to parties to implement the tax measures as a way of reducing tobacco prevalence (WHO 2010). WHO in these guidelines, urges parties to implement effective taxes on tobacco products that lead to higher real consumer prices (inflation-adjusted) which are desirable because they lower consumption and prevalence, and thereby in turn reduce mortality and morbidity and improve the health of the population. Increasing tobacco taxes is particularly important in three ways; (1) protecting young people and the poor from initiating or continuing tobacco consumption, this reduces the tobacco-related harm, including the burden of disease and death (2) it is the most cost-effective tobacco control demand reduction measure that reduces the prevalence of smoking and (3) it raises revenue for governments. The key policy measures under this article include; tax system reviews, tobacco product pricing, establishing track and tracing systems and trade agreements at national and regional level and international trade agreements.

A recent evaluation of the implementation of the WHO FCTC revealed that this article is one of the moderately implemented globally but weakest in Africa (Chung-Hall *et al.*, 2018). The weak implementation is mainly due to capacity of ministries of health and finance to implement tax policies that are favourable to tobacco control, aggressive tobacco industry influence, and lack of context specific evidence to drive policy implementation. The current global discussions on financing NCDs and the universal health coverage agenda is focusing on tobacco taxation as one of the avenues of domestic financing. Specifically, the Addis Ababa Joint Health Financing Arrangement for Africa 2015 and the Africa Agenda 2063 (African Union 2013; WHO 2015b).

Relatedly, is the illicit trade in tobacco products, Article 15 of the WHO FCTC, which seeks to eliminate all forms of illicit trade in tobacco products, including the illegal production and sale of these products. It establishes a range of measures to prevent illicit trade, promote law enforcement, and provides the legal basis for international cooperation. Although, the magnitude of tobacco illicit trade is argued by the tobacco industry to be high, there is not enough evidence to give a clear picture

of illicit trade in Africa, with specifics on drivers, nature, effects, magnitude, mitigation strategies that are sustainable in Africa. The research needed to address the knowledge gaps includes;

- (i)** Adjusted country specific estimates of relative risk and attributable fractions of mortality, health care costs, and disability due to tobacco use,
- (ii)** Current taxation regimes and systems and their effectiveness and impact,
- (iii)** Effective tax regimes and Sustainable financing of tobacco control extent and impact,
- (iv)** Economic cost of tobacco use/disease burden of tobacco related illnesses,
- (v)** Utilization and expenditures for treatment and disease specific costs,
- (vi)** Effective tobacco pricing for new and emerging tobacco products,
- (vii)** Contribution of socio-economic transitions on changes in tobacco use,
- (viii)** Market based estimates of productivity costs of death, disability and the interplay of insurance, labour force participation and earnings,
- (ix)** Tobacco industry influence on the tax structures, prices and market for tobacco products in Africa,
- (x)** Price elasticity changes overtime at different levels of tax and price, cross price elasticity,
- (xi)** Levels of illicit trade of tobacco products in Africa,
- (xii)** Drivers, nature, magnitude and effects of illicit trade,
- (xiii)** Mitigation strategies for illicit trade.



RESEARCH CAPACITY IN AFRICA

The current lack of critical capacity for research on the African continent, compounded by the high attrition rates, requires the agenda to provide a set of supportive actions to facilitate the overall coordination for capacity building in research. With the low and slow implementation of the WHO FCTC after ten years of implementation, it is timely for Africa to coordinate capacity building in tobacco control research to accelerate the implementation. The TCRA equally provides a timely opportunity for the Center for Tobacco Control in Africa (CTCA) to promote evidence-based national tobacco control programmes. The WHO FCTC Article 20 mandates Parties to undertake to develop and promote national research and to coordinate research programmes at the regional and international levels in the field of tobacco control. Parties are encouraged to initiate and cooperate with competent international and regional inter-governmental organizations and other bodies to conduct research and build research capacity. Thus, the TCRA will support the provision of the evidence required on the African continent to accelerate the implementation of the WHO FCTC.

This section will focus on 3 areas of research capacity; (a) highlighting existing capacity in terms of individual researchers' skills and competencies, institutional research capacity and existing materials for research; (b) the research capacity gaps and (c) the research capacity building approaches required for Africa.



5.1 Research Capacities in Africa

There is no clear documentation on the existing tobacco control research capacity in Africa. Most of the TC research is carried out by individual researchers within universities or from private research institutions, with a few from government departments. The WHO-CDC collaboration responsible for conducting tobacco prevalence surveys through the Global Tobacco Surveillance System (GTSS). There are knowledge hubs providing pieces of data on areas including tobacco taxation, tobacco industry monitoring, illicit trade.

Other institutions include universities and private research institutions. Several research materials have been developed and disseminated through websites, and other platforms such as meetings and workshops. The materials include standardized research tools including TQS and STEPS survey tools, developed by WHO and CDC (GATS 2011), guidelines such as the sin tax toolkit by WHO for tax modelling (WHO 2012b), Sustainability Index of national tobacco control programmes by Union, Global Smoke Free Compliance Tool (Union 2014), and the guide for Pre-testing Graphic Health Warnings (Hammond

and Reid, 2011) and tobacco industry monitoring tools. These tools have been very useful in guiding researchers in conducting research on smoke free compliance, assessing opinions on designed graphic health warnings, and have guided the conducting of prevalence surveys. Although some of these tools need to be adopted to the African context and collated in one platform for ease of access.

Africa has got several global partners who have provided research capacity, training and resources including human and financial. The partners include: Gates Foundation, the Bloomberg Initiative, NIH/NCI, American Cancer Society, USAID, IDRC, World Bank, Union, DFID, SIDA, Italian government.

5.2 Identified Research Capacity Gaps

Evidence-informed policies and programs can easily be impeded when there is insufficient capacity to produce new and/or relevant research to meet the information needs of decision makers in a timely manner (McDonald *et al.*, 2009). *Africa lacks adequate capacity for tobacco control research.* The current and potential socioeconomic burden of tobacco production and consumption underscores the need to bolster research capacity in developing countries. A scarcity of skills and competence for multidisciplinary and policy research is compounded by the failure of donor agencies to be proactive in funding research on evolving issues, lack of materials and tools to support research and weak or non-existent research collaborations (Baris *et al.*, 2000). The NCI is currently conducting a TC Research network analysis which will provide detailed information on who is doing what, who they are relating with, areas of focus and the gap. There is need to conduct a research capacity needs assessment to establish the current gaps.

5.3 Building Tobacco Control Research Capacity for Africa

The African region is still lagging behind in terms of the number of scientists to conduct high quality research. This is compounded by the limited resources and research institutions involved in tobacco control research. The research capacity building strategy will strengthen and increase research and analytical capacity in Africa to address the research gaps. Specifically, its objectives are to; (a) expand and integrate research capacity (b) strengthen TC research leadership in Africa and (c) engage key stakeholders around research capacity development.

Research capacity building will focus on individuals and institutions and will take a holistic approach. This is aimed at increasing numbers required to generate and mobilize resources for research as well as

build skills and competencies to conduct research. To achieve capacity building, the following strategies will be employed.

- (i) **Research support:** Resources to support masters and PhD students to undertake research in some of the priority areas will be identified. This will be done in partnership with universities, research institutions and other capacity building institutions both at regional and global level.
- (ii) **Research Fellowships and mentorship:** Programs will be designed and implemented in partnership with universities and other research institutions. An inventory of experts/mentors in different tobacco control areas will be created to support the fellows to build research capacity and provide research outputs required to drive policy implementation including; policy briefs, factsheets, reports and publications.
- (iii) **Seed granting:** Trained individuals will be supported with small grants/ seed-grants to develop ideas into fully fledged proposals and or conduct short term research projects to catalyse bigger research projects.
- (iv) **Short courses:** Research aimed at building research skills and competences will be identified. These will be delivered to individuals, groups and institutions and identified and disseminated to potential candidates. Some of these courses will adopt virtual, long distance learning or face-to-face methodologies.
- (v) **Public-private research partnerships:** These partnerships will be facilitated in technical environment.
- (vi) **Research Collaboration:** Establish collaboration between African training institutions, research agencies and individuals through structured arrangements.
- (vii) **Foster collaboration:** High, low- and middle- income research networks should integrate to enhance knowledge and skills transfer.
- (viii) **Lobby support institutional set up:** Use technology supported infrastructure to accelerate research and transform data into information products for utilisation at source and policy formulation.

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