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New thinking for global health: Conceptualising, measuring, and pursuing Community Positive Health

Martha Gutteridge, Laura E. R. Peters, Geordan Shannon, & Des Tan

Conceptualising Community Positive Health

Review of influential global health measures

Envisioning Community Positive Health measurement

The theoretical grounding of Stema

Stema

New Thinking for Global Health

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New thinking for global health: Conceptualising, measuring, and pursuing Community Positive Health

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ABSTRACT

The field of global health is founded on a deficit-based conceptualisation of health that overlooks the inherent value of communities, leading to top-down interventions that struggle to reach their full potential for effecting positive change. It remains unclear the extent to which current global health metrics follow this trend and reinforce it, or whether they encourage strategies to shift toward the World Health Organization's positive conceptualisation of health beyond the absence of disease. This white paper provides a scoping review of mainstream public health measures and the indicators that they contain, as well as an introduction to holistic health measures, found through academic search engines and grey literature. Indicators were compiled and sorted into thematic categories for comparison. The analysis found that most widely-used health metrics measure change in the burden of specific diseases, aggregated into population-wide statistics, neglecting the social and environmental determinants of health. There was little overlap in the indicators used by these frameworks, with each one measuring disparate topics. Holistic frameworks, founded on more inclusive concepts of health, contain promising ideas but lack impact, in part due to their lack of quantification. This research informs Stema's vision for a new approach to global health, using concepts such as resourcefulness and novel participatory methods fused with data science to create truly innovative approaches to understanding, measuring, and ultimately pursuing health in ways that uplift and support communities to thrive.

1 The current landscape of global health

Martha Gutteridge, MRes; Laura Peters, PhD; Geordan Shannon, PhD & Des Tan, MSci (Stema)
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1.1 INTRODUCTION

The World Health Organisation (WHO) defines health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (WHO, 1947). Beyond this, the conceptualisation of health is open to debate. The way in which health is defined shapes the way that it is measured, which shapes how authorities make decisions surrounding health. The field of global health is currently dominated by an overly biomedical focus that views people in terms of their statistical output, overlooking the integral value, agency, and resourcefulness of communities. Health interventions are often made by those furthest from the issue, and the most common methods of data collection are extractive, burdensome and outdated. Methods of measurement used in global health encapsulate these limitations. This paper presents a review of commonly used health frameworks in a critique of global health perspectives, which influence the directions of research, policy and practice. We introduce the Stema approach alongside a systematic reconstruction of the principles and feasible goals for "community positive health", laying the foundation for a more equitable and sustainable future in this field.

The issues discussed in this review have been presented in discrete sections, but are interlinked with feedback and nuance. Rather than targeting one issue at a time, a systems thinking approach to community positive health is needed if lasting change is to be made – systems thinking is an approach that considers all interacting elements of complex and dynamic systems, where the connections are as important as the elements. In health, this involves the relationships among the factors that contribute to health, the spaces between them, and the synergies that come from their interactions (World Health Organisation, 2009). In appreciating an entire system rather than individual problems, pressure points can be identified and the potential unintended consequences of interventions considered.

1.2 POSITIVE AND NEGATIVE HEALTH

The idea of health differs for everyone who considers it, with a key dichotomy being that between positive and negative health. In mainstream medicine, academia and policy, health has historically been defined as the

absence of disease; it is seen in a biomedical way that focuses on whether an individual is functioning and statistically normal (Boorse, 1977; Hyett et al., 2019; Morgan & Ziglio, 2010). This is a negative conceptualisation of health, focusing on absence instead of considering the presence of factors which nurture and build health. Negative health ideas commonly translate into deficit-based models, with the aim that weaknesses can be targeted to restore a baseline level of health in the population (Morgan & Ziglio, 2010). While biomedical reductionism has led to many breakthroughs in medical research, the additional influence of social, psychological, political, and environmental factors on health means this approach alone cannot solve global health challenges (Braveman & Gottlieb, 2014; Hernandez, 2006). Although the WHO cited physical, social and mental well-being in their constitution, the measurement of overall health since then has still predominantly relied on deficit-based models, which can by nature only aim to reduce health disparities (Morgan & Ziglio, 2010).

"When health is conceptualised positively, the factors considered tend to include more psychosocial notions outside the basic metrics of health, such as connection with other people and the environment."

Conversely, positive health considers factors that can increase and sustain health, known as salutogens (Antonovsky, 1979; Mittelmark et al., 2016). Salutogenesis is the generation of health from factors that support wellbeing, rather than damage it. The salutogenic model is a guiding framework for positive health; it is multifaceted, but a common thread is the idea of coherence, whereby people consider life to be structured, manageable, and meaningful, and are consequently able to mobilise resources to overcome health adversity. Salutogenesis drew the focus of authorities towards positive health, and has been consistently developed, revised, and applied to diverse fields of health promotion since then (Mittelmark et al., 2022).

When health is conceptualised positively, the factors considered tend to include more psychosocial notions outside the basic metrics of health, such as connection with other people and the environment. Many social settings and cultures consider health in a more positive way than mainstream academia. For example, when positive health was investigated in Canadian First Nations communities, it was found that members, especially women, are

significantly more likely to have excellent or very good health when they have high levels of social support (Richmond et al., 2007). An explorative study that looked to understand Indigenous health in Southern Ecuador found components including peacefulness, community, and social welfare, with the final definition of health resting on an environment of mental, emotional, physical and spiritual balance (Bautista-Valarezo et al., 2020). Whilst we can intuit that social support and peacefulness are likely to increase health in any group, they are an area of salutogenesis largely overlooked by current health measurement.

The conflict between widespread deficit-based health models in academia and positive health in real communities is just one of the issues with current health frameworks. When intervening bodies conceptualise health differently to the people they are trying to help, the outcomes of a prescribed intervention are unlikely to be ideal for the community.

1.3 COMMUNITY HEALTH

Community health is not widely used as a concept in healthcare or policy; it is either thought of as biomedical health practised outside of hospitals, or it is measured as a sum of individual health outcomes. The WHO defines it as "environmental, social, and economic resources to sustain emotional and physical well being among people in ways that advance their aspirations and satisfy their needs in their unique environment" (WHO, 1986). This considers the important contribution of non-biomedical factors to health, but still does not reflect the idea of community as something greater than a collection of individuals. Beyond the WHO definition from 1996, this powerful idea has not been extensively explored in practice, despite its potential to catalyse positive change.

Stema believes that community health is more than just the sum of its parts, and is both key for the nurturing of positive health in its members and inherently valuable as a standalone concept. Community positive health has been conceptualised by Stema as a spectrum of wellbeing and flourishing at the community level, partially independent from disease or infirmity, that is determined by a collection of health assets (Peters et al., 2021).

Community itself is a term that is used in many contexts with endlessly different meanings (Franz et al., 2018; Walmsley, 2006). In its fieldwork with partners in South America and Africa, Stema has traditionally defined a community by the shared conditions and constraints that people face (https://www.stema.org/field-projects). However, insight into the meaning

of community has evolved with Kenyan partners in recent fieldwork (Peters et al., 2021).

"Communities can be seen as networks
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Communities are social constructs that can be dynamic or static, with people often belonging to many at once which can overlap and change over time. The communities that collaborate with Stema are formed on the basis of where people live, work or are from; a shared identity; or shared conditions such as resource access or constraints. Some, like religious groups, are long-lasting with a strongly homogeneous shared identity, while others continually shift to contain people from diverse walks of life. They may form around health issues or interventions, or not consider health at all – when external organisations work with these groups, the inherent social and political dynamics must be considered. Communities can be seen as networks with corresponding networks of capabilities for health. In light of this dynamic nature, community positive health is better conceptualised as a continuous process rather than a single achievement (Peters et al., forthcoming).

The ecological model of health promotion proposes that health interventions should consider health at multiple scales rather than focusing on individual behaviour and choice (Garney et al., 2019; McLeroy et al., 1988). In comparing the complexity of health with that of natural ecosystems, McLeroy (1988) suggests targeting health issues at many levels at once, such as at public policy, institutional, and interpersonal levels. In this model, as well as socially and politically, communities are the bridge between the large and small scales of health. Modifications to the ecological model to reflect a richer conceptualisation of health, more inclusive to those usually overlooked by Western academia, would allow community health to be used more effectively in modern health interventions. Aspects of health that are significant to the people being measured should be used to reshape the model in context-specific ways. The health of Australian First Peoples, for example, is affected by factors such as land, kinship and cultural survival, and health schemes that integrate this understanding will be more relevant and successful (Rowley et al., 2015).

Previous approaches prioritising community health have produced mixed results. These long-term outcomes have been suboptimal, not because it is a poor area to target, but because approaches narrowly focused on promoting a technology or targeting a single disease (Peters et al., 2021). When the focus is on a specific technology or subsection of health, the multiple dimensions and resources that contribute to long term positive health tend to be overlooked (Frenk et al., 2014). There is also a low level of commitment to the sustainability of public health projects, which minimises the impression of success when benefits are sometimes only seen 3-10 years after a health intervention (Thompson et al., 2000; Walugembe et al., 2019). This low-level commitment may also be reflected in donors making short-term investments rather than building long-term relationships with communities as partners.

Another prominent flaw in previous attempts to improve community health has been a lack of dialogue in the design phase of health interventions, demonstrating what is referred to as a 'top-down' approach (Peters et al., 2021; Shediac-Rizkallah & Bone, 1998). The scope and limitations of a top down approach will be discussed in the next section.

1.4 TOP-DOWN APPROACHES

Research methods and interventions that do not involve the people targeted by an intervention are broadly known as top-down approaches. These frequently reflect a power imbalance and lack of communication between the academic or governing bodies and the recipients of the health intervention. As well as top-down approaches commonly conceptualising health differently to communities, they tend to overlook their true needs and goals through either ignorance or implicit bias (Duke et al., 2021).

"When top-down methods are used for health interventions, communities become recipients of external help more comparable to clients or patients rather than active agents for their own health."

When top-down methods are used for health interventions, communities become recipients of external help more comparable to clients or patients rather than active agents for their own health. Consequently, health interventions tend to be unsustainable in the long term, as when external help is withdrawn, people do not have the resources or training needed to sustain the benefits that were achieved in the short-term (Walugembe et al., 2019). Top-down approaches can fail to recognise that communities already have assets and resources with the potential to enhance their health in a more sustainable way, or choose to ignore these, instead prioritising external interests or technologies. Another facet of this is that health improvements are not attributed to the communities themselves, while they are often blamed for failures. Thus, when there is success, the implementing agency can attract more donor funding, but where there is failure, the community is seen as a poor investment environment. This entrenches marginalisation and vulnerability, underlying poor health outcomes.

1.5 HOW MEASUREMENT IS USED IN GLOBAL HEALTH

The way in which health is measured has a considerable impact on people's daily lives. An abundance of health metrics are interpreted by authorities to decide where health interventions should be implemented and what they should entail. Health metrics are also crucial in monitoring and evaluating the progress of interventions, ultimately ensuring that their objectives are achieved. With this significance in mind, the state of current health

measurement leaves much to be desired; the issues with measurement exemplify those seen in the wider space of global health.

A health indicator is a measure or criterion used by public health organisations to monitor changes in health (Imp-Act, 2005). An index is made through the weighting and combination of these health indicators into a single quantitative value, as this is easier for governing bodies to analyse than simultaneously considering a wide array of indicators. The framework of an index refers to the set of indicators used and the methodology used to weight and combine them (Santos & Santos, 2014).

Before it is validated in the field, the initial creation of an index involves three main tasks: conceptualisation of what is being measured; selecting indicators to adequately represent this; and assigning weights to each indicator to then aggregate them into a single value (Lewis-Beck et al., 2004; (Santos & Santos, 2014). Whilst there can be debate around the weighting and aggregation of indicators, the main shortcomings of the current health frameworks covered by this paper fall into the conceptualisation of health and subsequent selection of indicators to represent this.

In order to examine the focus of authorities when making measurements in the field of health, Stema compiled a review of the most commonly used frameworks and the indicators they contain. A systematic approach was used to identify influential health frameworks, outlined in Section 1.5.1. Results reveal common similarities and deficits among them, shown in Table 1 below.

1.5.1 Methods

First, an online search was performed for influential organisations in public and global health. Grey literature relating to public health organisations was scanned for health measurement systems and data. The websites of the following organisations were searched: Bloomberg School for Public Health, Brookings (US), Chatham house (UK), Deusto, European Centre for Disease Prevention and Control, Fraser institute (Canada), Gates Foundation, Gavi, Global Fund, Global Health 5050, Harvard Global Health Institute, Health and Global Policy Institute (Japan), Health Foundation (UK), Institute for Health Metrics and Evaluation, ISGlobal (Spain), Kings Fund (UK), Organisation for Economic Co-operation and Development, Oxford Poverty and Human Development Initiative, Our World In Data, RAND corporation, United Nations Development Programme, United States Agency for International Development, World Health Organisation, and World Bank.

A search of academic literature was then performed to find any further indexes or sets of indicators that may have been missed in the grey literature. The search was limited to the last 10 years and to articles visible on Google Scholar. The search string used was as follows:

allintitle: "Global health" OR "public health" OR "population health" AND "health framework" OR "health indicators" OR "health index"

The search yielded 180 results since 2012. Results that focused on measuring one disease or condition were deemed too specific, as the intent of the search was to find ways that health as a whole is measured. 30 articles were relevant, 38 were irrelevant, 78 were too specific, and 6 were duplicates. 28 results were references with no available online publication. Several health frameworks were found that are no longer used, as well as ones which have been proposed but have not yet been widely used. As the purpose of this review is to show a high-level overview of the field of global health, these were not included.

From the frameworks that were selected as relevant, mainstream, and influential, the individual indicators were screened and summarised in Table 1. A more detailed list of indicators used for each measure is shown in Table 2. As these publications are primarily not developed by academic researchers, the majority of them were not defined in academic journals but in self-published reports or pages on the websites of each organisation. These full texts were screened for further insight into the context of the frameworks.

Table 1: A summary of the domains of health used in a selection of influential health measurement systems.

Organisation	Measurement system	Type	Scope	Communicable diseases	Economic factors	Education	Environment	Equity of access	Gender Equality	Governance	Infrastructure	Maternal health	Mental health	Mortality	NCDs	Nutrition	Social support	WASH
World Health Organisation (WHO)	Global Health Observatory	Indicators	Global	x			x	x	x	x	x	x	x	x	x			x
European Commission	European Core Health Indicators	Indicators	European Union	x	x			x				x	x	x	x	x	x	
World Bank	HealthStats	Indicators	Global	x	x	x		x				x		x	x	x		x
Institute for Health Metrics and Evaluation (IHME)	Global Burden of Disease	Indicators	Global	x								x			x			
Goalkeepers	Indicators for good health and wellbeing	Indicators	Global	x	x							x						x
Organization for Economic Co-operation and Development (OECD)	Health status indicators	Indicators	OECD member countries	x	x							x		x	x			
U.S. Agency for International Development (USAID)	Demographic and Health Survey	Indicators	Global	x		x		x				x		x		x	x	x
Office of National Statistics (ONS)	Health Index for England	Index	England	x	x	x	x	x			x			x	x	x	x	
Centers for Disease Control and Prevention (CDC)	National Environmental Public Health Tracking Network	Indicators	USA	x	x		x				x	x			x	x		x

Table 2: Health indicators used in a selection of influential health measurement systems.

Organisation	Measurement system	Type	Domains covered
World Health Organisation (WHO)	Global Health Observatory	Indicators	Dementia, road safety, nutrition, priority health technologies, tobacco control, child health, vaccine-preventable communicable diseases, mental health, immunisation coverage, violence prevention, STIs, health equity, international health regulations, WASH, violence against women, neglected tropical diseases, environment and health, women and health, substance use disorders, HIV/AIDS, NCDs, health workforce, life expectancy, AMR, malaria, air pollution, alcohol, health systems (pharmaceuticals, governance, security, financing), maternal and reproductive health, universal health coverage, tuberculosis
European Commission	European Core Health Indicators	Indicators	demographic and socio-economic situation (birth rate, income inequality, mother's age, poverty, population, fertility, unemployment), health status (asthma, COPD, dementia/alzheimer, physical and sensory limitations, depression, diabetes, disease-specific mortality, drug-related deaths, HIV/AIDS, health expectancy, infant mortality, injuries, life expectancy, long-term activity limitations, low birth weight, perinatal mortality, selected communicable diseases, self-perceived health, chronic morbidity), health determinants (blood pressure, BMI, consumption of fruit and vegetables, alcohol consumption, PM exposure, physical activity, regular smokers, social support, alcohol consumption, illicit drugs, work related health risks), Health interventions: health services (hospital fatality of AMI and ischemic stroke, average length of stay, breast cervical and colon cancer screening, equity of access to dentistry and health services, expenditures on health care, health professionals, hospital beds, hospital day-cases, hospital in-patient discharges, influenza vaccination rate in elderly, insurance coverage, CT/MRI technologies, medicine use, patient mobility, nurses, physicians, outpatient visits, surgeries, cancer survival rates, vaccination coverage in children, waiting times for surgeries)
World Bank	HealthStats	Indicators	Education, labour force, employment (split by gender), mortality rate due to disease injury pollution poisoning unsafe WASH or suicide, health financing (capital, domestic gov, domestic private, people pushed into poverty, out-of-pocket, risk of catastrophic expenditure, etc), HIV/AIDS, immunisation, infectious diseases (acute respiratory infections, malaria, diarrhoea, tuberculosis), medical resources and usage (CHWs, hospital beds, surgical procedures, nurses and midwives, physicians, surgeons), NCDs (diabetes, tobacco use, hypertension, alcohol consumption), nutrition, population dynamics, reproductive health, WASH
Institute for Health Metrics and Evaluation (IHME)	Global Burden of Disease	Indicators	369 diseases and injuries (Communicable, maternal, neonatal, and nutritional diseases, non-communicable diseases, and injuries)
Goalkeepers	Indicators for good health and wellbeing	Indicators	Child and maternal mortality rate, HIV, TB, malaria, neglected tropical diseases, neonatal mortality, stunting, smoking, sanitation, family planning, vaccines, universal health coverage, poverty
Organization for Economic Co-operation and Development (OECD)	Health status indicators	Indicators	Mortality, life expectancy, causes of mortality, maternal and infant mortality, potential years of life lost, avoidable mortality, morbidity, perceived health status (by age, gender, and socioeconomic status), infant health, communicable diseases, cancer, injuries, and absence from work due to illness
U.S. Agency for International Development (USAID)	Demographic and Health Survey	Indicators	Fertility, family planning, marriage, sexual activity, infant and child mortality, adult and maternal mortality, reproductive health, child health, nutrition, malaria, HIV/AIDS, adult health (health insurance coverage, tobacco usage), women's empowerment (ownership of assets, participation in decision making, attitude towards wife beating, justified in refusing sex, informed decision making for reproductive health), female genital cutting, domestic violence, child protection, education, employment, WASH, household characteristics, communication

Organisation	Measurement system	Type	Domains covered
Office of National Statistics (ONS)	Health Index for England	Index	Mortality, physical health conditions (cancer, cardiovascular, dementia, diabetes, kidney and liver, musculoskeletal, respiratory), difficulties in daily life (disability, frailty), personal well-being (worthwhile, anxiety, happiness, satisfaction), mental health, physiological risk factors (blood pressure, birthweight, obesity), behavioural risk factors (alcohol, drug, nutrition, physical activity, sedentary, smoking), economic and working conditions (child poverty, housing affordability, job-related training, unemployment, workplace safety), children and young people's education and pregnancy, protective measures (cancer screening, STIs, vaccination), access to green space, living conditions (air pollution, household crowding, noise complaints, road safety, rough sleeping) access to services (distance to GP, pharmacy, sports facilities, internet), crime
Centers for Disease Control and Prevention (CDC)	National Environmental Public Health Tracking Network	Indicators	Air quality, asthma, biomonitoring population exposures, birth defects, cancers, childhood lead poisoning, COPD, community characteristics (housing age, food environment, households, internet, land cover and use, medical infrastructure, vegetation, vulnerability/preparedness for precipitation and flooding), community design (access to parks and public elementary schools, commute time, motor vehicle fatalities, proximity of population and schools to highway, types of transportation to work), COVID-19, developmental disabilities, drinking water, drought, environmental justice (demographics, environmental quality, health status, households, internet, social vulnerability, socioeconomic status), heart disease and stroke, heat and heat-related illness, hormone disorders, lifestyle risk factors, pesticide exposures, populations and vulnerabilities, precipitation and flooding, radon, reproductive and birth outcomes, sunlight and UV, toxic substance releases, unintentional carbon monoxide poisoning

1.5.2 Limitations of mainstream health measurement and data

a) Limitations of mainstream health measurement

The measurement of health should be a politically-neutral activity that is comprehensive and free of bias. In reality, health is inherently value-laden and each organisation that measures health inevitably has its own goals and preconceptions in mind.

By choosing which indicators to include in health measurement, the creators of frameworks decide how to conceptualise health; any subsequent decisions based on the data cannot challenge this concept of health. In the review of influential health measurements shown in Table 1, every organisation is from either Europe or the USA, despite many being further-reaching in their measurement efforts. This coincides with a Western and biomedical framing of health, which may not align with the priorities of the people being assessed, especially in global datasets that attempt to measure health in more marginalised settings. In cases such as these, it becomes more likely that these influential organisations are disconnected from the issues they are trying to solve and instead highlight the health issues and narratives their own organisations aim to address. Health frameworks would ideally be made by and for the people they aim to assess, but they exist in a political economy where not everybody has the capacity to do this. By collaborating with communities on health conceptualisation and measurement, we can reduce the preconceived notions and oversights of existing health frameworks (Richmond et al., 2007).

While some of the frameworks reviewed include many indicators of health, such as the WHO Global Health Observatory, all of them are made with a specific goal and audience in mind. These goals, in addition to the aforementioned biases, will impact the indicators involved. An example of this is the health indicators chosen by the Organisation for Economic Co-operation and Development (OECD). They are an economic organisation rather than one solely focussed on health, and as a result have included several indicators not seen in the other frameworks: pharmaceutical market, healthcare utilisation, and health workforce migration. These are important, but when included within health indicators may skew results away from the health of the population and towards the 'strength' of an economy as reflected by constructs such as GDP and health expenditure, factors which do not reflect the health of the working class (Kapp, 1950). None of the frameworks in Table 1 contain all of the possible indicators, and in fact the only indicator common to all frameworks is communicable diseases.

When considering the introduction of positive health to mainstream frameworks, it is also worth noting that mental health is only considered by three of these frameworks, despite its existence as a well-established field in health. Illustrated by the extreme example of economic factors above, the inclusion of different sets of indicators will inevitably skew the results in slightly different directions, despite the attempted neutrality of these international organisations. There is redundancy among the frameworks, and yet none cover the full variation of health indicators – this demonstrates the wide diversity of potential health perspectives.

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All of the health frameworks shown in Table 1 are based primarily upon a deficit-based model of health. Deficit-based models generally conceptualise health in simplified biomedical ways, and so tend to overlook factors that are outside the realm of healthcare. To illustrate this, education plays an important role in shaping health, but of the indices shown in Table 1 only three of the nine consider education. A 2018 Stema field project on community health in Sierra Leone found that a critical barrier to health was transport infrastructure, a factor that would be entirely overlooked by six of the frameworks shown in Table 1 (stema.org/field-projects). Although deficits are easier to measure on a large scale than factors that nurture health, an abundance of factors are overlooked that could lead to innovative and efficient health improvement. The recipients of measurement are framed in a needlessly negative light, while factors which may support their positive health are kept in the shadows.

Community health as a standalone concept, rather than a sum of individual health, is not captured in any of the health frameworks shown in Table 1. Even then, for many of these measures, collective health can only be seen at city level or higher (county, state, country), rather than separating the data by other factors that can form community such as race, sex, or religion. Only the CDC's National Environmental Public Health Tracking Network mentions community as a factor affecting health, and it does not consider community health as a concept in its own right, but rather the built environment and proximity to various facilities. Collective conditions such as empowerment and social capital influence healthcare access and shape the environment in a

way that will also impact health, making this an area that should not be overlooked (Campbell & Jovchelovitch, 2000; Peters et al., 2021). Communities are powerful agents of change, and by incorporating their participation into mainstream health research, the depth and success of health interventions could be greatly improved.

In national and international measures for health, the precedent for measurement is to present an array of indicators, rather than combining them into a single composite index for health. The only measure in Table 1 that produces a single numerical value is the health index for England, by the ONS. This is an experimental statistic and has some limitations: there is not enough data available to present a rich concept of indicators such as mental health; there are often gaps in the data where they have had to use values from back-series; and they have not been able to use measures which are directly related to policy, as a change on policy (such as an increase in the number of adults that can access social care) will change the health index value, despite there being no change in the actual health of the population. Despite these limitations, the index is an admirable statistic that includes a wide range of factors that determine health, and produces a single attention-grabbing figure that can be used by policy-makers. However, this is not the norm. When health is measured as a single index, it is usually as part of an index measuring something adjacent to health, such as the Multidimensional Poverty Index by OPHI and the Human Development Index by UNDP. In both of these, health is simplified to the most basic metrics, such as nutrition, child mortality, and life expectancy at birth. Since health is already generally viewed as an array of data, including non-health concepts such as the pharmaceutical market, it is feasible to propose that more positive measures of health and wellbeing should be included in this view.

"The issue with focussing on individual diseases is that it limits priorities to finding cures for these diseases, rather than addressing the root issues that lead to poor health."

The burden of specific diseases is predominantly what is used to measure health on a global scale (Roser & Ritchie, 2021). The issue with focussing on individual diseases is that it limits priorities to finding cures for these diseases, rather than addressing the root issues that lead to poor health. However, even in a scenario where a perfect and comprehensive measurement framework was created, it fundamentally could not provide an answer to what would be best for the people assessed. The decision of how to

interpret data always ends up in the hands of the authority who commissioned the framework, which presents the same issues as seen in framework creation, namely that they rarely consider the health goals of the people targeted. Participatory approaches and long-term partnerships are consequently key alternatives for bringing local perspectives into decision making for health. Communities, even when faced with challenges, ought to be appreciated for the knowledge, skills, and assets for health they already have.

b) Limitations of data collection

The lack of data collection infrastructure in countries that are most disadvantaged deepens the existing divide between health policy makers and the people closest to the issue. If a community can decide what data would be most meaningful, collect it themselves, and have easy access to it, this gives them power to pressure for change and plan their own health schemes with quantitative evidence rather than just hearsay. Data lends authority to the process and additionally makes any local plans more likely to be successful.

> "... people in marginalised and extreme settings lack accessible, reliable data about their own health, limiting the power of community-based interventions."

When Stema carries out initial assessments in field projects, a consistent finding is that people in marginalised and extreme settings lack accessible, reliable data about their own health, limiting the power of community-based interventions. Whilst data is frequently collected from these areas, the process is usually extractive. Household questionnaires are performed by external researchers or the government, who leave without sharing the data or outcomes with the participants. Household surveys are both labour and time intensive, and the power imbalance involved with external researchers may influence people to tell them what they want to hear, especially when certain responses correspond to whether aid will be received.

The subsequent processing and analysis of data is even more inaccessible to the people being studied. The largest players in the field of health statistics employ methodologies which are often opaque to even other researchers in the field, let alone those that may not have consistent access to the internet and education (Schwab, 2020). Another theme that Stema has continually found is that disadvantaged communities rarely get to hear the results or experience the claimed benefits of research that is performed using data gathered from them. In a system where data is harvested, analysed with opaque methods, and often aggregated with analysis from multiple countries to create a headline to generate the most funding, it is easy to see how poorly the people who provide this data can fare (Schwab, 2020).

1.6 MEASURING COMMUNITY POSITIVE HEALTH

Robust ways of measuring positive and community health are needed if the dialogue in global health is to be shifted away from purely biomedical concepts. Positive health is difficult to approximate using traditional statistics, as the concepts involved tend to be more subjective, such as wellbeing, connectedness, and spirituality (Prinsen & Terwee, 2019). While there are not any well-used frameworks that analyse positive and community health in ways that align with the theories discussed in this paper, there are frameworks that study similar or adjacent concepts.

1.6.1 Methods

To identify community positive health frameworks, a Google Scholar search was performed for:

allintitle: "positive health" OR "community health" OR "community positive health" AND Measurement OR framework OR indicator OR index

Studies were included if they had been cited in the current year (2022) and considered either positive or community health.

Studies were excluded if they were limited to one country or culture, were not publicly accessible, did not provide a method of health measurement, were not about humans, or focussed on one specific disease or health condition.

1.6.2 Envisioning community positive health: community positive health frameworks

An illustrative sample of the results found are presented in Table 3, showing which indicators tend to show up in which measures. A full list of indicators is shown in Table 4. Four wellbeing and quality-of-life frameworks are shown, as these are a widely used proxy for positive health. Not all of the available measures were included as they have similar methodology and content. A selection of scales that aim to measure community health in some capacity are also shown. Finally, frameworks measuring childhood opportunity and the fulfilment of indigenous rights have been included, as they are exemplary of the powerful effect that data and measurement can have on collective wellbeing.

The WHOQOL-100 is a questionnaire consisting of 100 questions measuring quality of life. It has been adapted for use in 29 different languages and aims

to be applicable across different cultures. Although the WHO has stopped maintaining and updating the questionnaire, it is still widely used, with Google Scholar search yielding 568 results citing it in the first half of 2022 (Table 2). WHOQOL-100 is the most popular example of a well-established genre of wellbeing and quality-of-life questionnaires. Although some of them are used to measure quality of life in a non-biomedical context, the majority of their usage comes from assessing the impact of various medical procedures, rather than treating wellbeing as an inherently important part of general health. SF-12, the Quality of Life Scale, and the Personal Wellbeing Index (PWI) (Table 2) are examples of these measures, which are all generally similar, covering areas such as physical health, personal relationships, and personal accomplishments in life. While these are valuable tools in the context of medicine and research projects, they are not often used to assess the wellbeing of populations, with unfulfilled potential to be used as part of general health statistics.

“In the search performed, no framework
considers community health as
something more than an aggregate of
individual health.”

In the search performed, no framework considers community health as something more than an aggregate of individual health. The Community Wellbeing Index (CWI), despite its promising title, measures an individual's level of satisfaction with the local place of residence rather than collective wellbeing. It still covers valuable topics such as trust, belonging and distribution of wealth, but relies entirely on satisfaction questionnaires (which provide a statement with a 1-5 agreement scale) rather than empirical data on factors such as wealth and social services. The consideration of equality and social factors is a step in the right direction, but more could be done to encompass the health of collectives. None of the other measurement systems found were relevant or well-used enough to best represent the current field. In addition to these more holistic measures, no national indicators use geographic or other communities as their unit of analysis. There is a growing movement towards disaggregating data to split it into demographic groups such as ethnicity and sex, which can analyse communities formed on the basis of religion for example, but not all countries do this (Hosseinpoor & Bergen, 2016).

Almost all of the positive health frameworks found, as well as the CWI, rely on a satisfaction scale to quantify their data, which ultimately comes from a questionnaire. The first four frameworks in Table 3 are examples of this, but

many more were found in the literature search. The Child Opportunity Index (COI) is not advertised as a health measurement scheme, nor a wellbeing scale. It does however uniquely use non-questionnaire data to paint a picture of the conditions that lead to children's opportunities, conditions that will consequently affect adults as well. The COI successfully uses quantitative data to assess education, health and environment, and social and economic factors. The only factor missing from this, that satisfaction scales can easily assess, is the domain of interpersonal relationships and inner sense of achievement seen in the first four frameworks shown in Table 3. Despite this, the COI is a successful example of aggregating different types of data to assess their impact on individuals' life experience. Self-reported values are uniquely useful in measuring abstract concepts, but have limitations: they are not valid without comparison to a reference group ('concurrent validity'), and are often victim to self-reporting bias (Althubaiti, 2016). The measures found in this search that are explicitly linked to health used predominantly outdated methodology to aggregate their data.

The COI is the exception to the rule; the majority of the frameworks that consider theories such as positive health and resourcefulness tend to not be quantitative, or even use data at all. Although not shown in Table 3 due to their low usage, several frameworks that have holistic and progressive views of health and community were found during the literature search. An example of this is the Social Care Wales Framework for Community Resourcefulness, which consists of a list of domains such as thought leadership, with guidance and resources on how to implement these domains into local planning. The lack of indicators for assessing these factors may be due to the difficult logistics that would be required, and perhaps results in the low citation rate of the framework. In the field of measuring positive and holistic concepts of health and community, frameworks are made less to create hard-and-fast measurements, but more to act as a guide of factors to consider when making plans for new policy or building plans. This approach could have the effect of diminishing the importance of wellbeing; when a framework is used as inspiration rather than something to which people will be held accountable, it can always be ignored.

The Indigenous Navigator (Table 2) is a framework that helps indigenous peoples monitor the fulfilment of their rights and whether local authorities are doing enough to support this. As well as including complex concepts such as cultural integrity, The Indigenous Navigator includes an online tool for populating the framework with data, making it easy for marginalised groups to create and have control of quantitative data regarding the upholding of their rights. This interactivity is an important feature, especially when contrasted to the usual extractive nature of health data collection. Allowing communities to create and control their data allows them in turn to use this

to hold authorities accountable, giving them a louder voice. The Indigenous Navigator has been widely used across the globe and is a compelling example of the impact a well-executed framework can have. Whilst the fulfilment of indigenous peoples' rights is not directly within the field of global health, there is a large overlap between the components considered and those that are seen in conversations around positive health. It is an area where authorities are being forced to consider wellbeing in an unprecedented way, making it an ideal source of inspiration for success in positive health measurement. A combination of the tools provided by the Indigenous Navigator with the thoughtful data usage demonstrated by the COI could lead to far greater autonomy and inclusivity than is currently seen in global health measurement.

Table 3: A summary of the domains used in a selection of wellbeing and quality-of-life frameworks.

Measurement System	Organisation	Published	Type	Usage all time	Usage 2022	Physical capacity/ health	Psycho-logical	Indepe-ndence	Social	Environ-ment	Spirituality	Comm-unity	Employ-ment	Safety/ security	Education	Economic	Rights and freedoms
WHOQOL-100	WHO	2012	Questionnaire of quantified indicators	13,600 results	568 results	×	×	×	×	×	×		×	×			
Quality of Life Scale	JC Flanagan	1982	Questionnaire of quantified indicators	1,680 results	44 results	×			×				×		×	×	
SF-12	Ware, Kosinski, & Keller	1996	Questionnaire of quantified indicators	11,600 results	573 results	×	×		×				×				
Personal Wellbeing Index (PWI)	International Wellbeing Group	2013	Questionnaire of quantified indicators	667 results	38 results	×			×		×	×		×			
Community Wellbeing Index (CWI)	International Wellbeing Group	2011	Questionnaire of quantified indicators	62 results	5 results				×	×			×			×	
Child Opportunity Index (COI)	diversitydatakids.org	2014	Composite index	283 results	80 results	×			×	×			×		×	×	
The Indigenous Navigator	International Work Group for Indigenous Affairs	2014	Framework, index, and questionnaire of quantified indicators	54 results	3 results	×				×			×	×	×		×

Table 4: Indicators used in a selection of wellbeing and quality-of-life frameworks.

Measurement System	Organisation	Published	Type	Domains
WHOQOL-100	WHO	2012	Questionnaire of quantified indicators	Physical capacity (pain and discomfort, energy and fatigue, sleep and rest), Psychological (positive feelings, thinking learning memory and concentration, self esteem, body image and appearance, negative feelings), Level of independence (mobility, activities of daily living, dependence on medication or treatments, work capacity), Social relationships (personal relationships, social support, sexual activity), Environment (physical safety and security, home environment, financial resources, health and social care: accessibility and quality, opportunities for acquiring new information and skills, participation in and opportunities for recreation/leisure activities, physical environment (pollution/noise/traffic/climate), transport), spirituality/religion/personal beliefs
Quality of Life Scale	JC Flanagan	1982	Questionnaire of quantified indicators	Material well-being and financial security; Health and personal safety; Relations with parents, siblings, other relatives; Having and raising children; Relations with spouse or significant other; Relations with friends; Activities related to helping or encouraging others; Activities related to local and national government; Intellectual development; Personal understanding; Occupational role; Creativity and personal expression; Socialising; Passive and observational recreational activities; Active and participatory recreational activities
SF-12	Ware, Kosinski, & Keller	1996	Questionnaire of quantified indicators	Health in general, Moderate activities, Climbing several flights of stairs, Health limiting work or accomplishments, Emotional problems limiting accomplishment and carefulness, Pain, Calm and peacefulness, Energy, Downhearted and blue, Social activities
Personal Wellbeing Index (PWI)	International Wellbeing Group	2013	Questionnaire of quantified indicators	Standard of living, Personal health, Achieving in life, Personal relationships, Personal safety, Community-connectedness, Future security. Optional questions on General life satisfaction and Spirituality or religion.
Community Wellbeing Index (CWI)	International Wellbeing Group	2011	Questionnaire of quantified indicators	Economic situation, Environment, Social conditions, Distribution of wealth, Health services, Social services for older people, Support to families, Trust in people, Leisure services, Belonging, Security, and Life in general in your place of residence
Child Opportunity Index (COI)	diversitydatakids.org	2014	Composite index	Education (AP enrollment, adult educational attainment, college enrollment, early childhood education enrollment, high school graduation rate, 3rd grade maths proficiency, 3rd grade reading proficiency, school poverty, teacher experience, early childhood education centres, high quality early childhood education centres), Health and environment (access to healthy food, access to green space, extreme heat exposure, health insurance coverage, ozone concentration, airborne microparticles, housing vacancy rate, walkability, hazardous waste dump sites, industrial pollutants in air water or soil), Social and economic (poverty rate, public assistance rate, homeownership rate, high-skill employment, median household income, employment rate, commute duration, single-headed households)
The Indigenous Navigator	International Work Group for Indigenous Affairs	2014	Framework, index, and questionnaire of quantified indicators	General human rights and fundamental freedoms, Cultural integrity, Lands, Territories and natural resources, Fundamental rights and freedoms, Participation in public affairs, Legal protection, Access to justice and remedy, Cross-border contact, Freedom of expression and media, General economic and social development, Education, Health, Employment and occupation, Self-determination.

1.7 A LANDSCAPE OF REDUCTIVE METHODS

The way that health is currently conceptualised, measured, and intervened by the most influential organisations does not translate to improved processes and outcomes for community health. Existing frameworks that consider positive health tend to act as guides for understanding an issue, as opposed to a framework for measurement. Consequently they are not widely used, detracting from their important message.

Deficit-based models are widely used but ignore sociopolitical factors contributing to health, and focus on failings and avoidance of disease rather than creating health and wellbeing (Peters et al., 2021). Governing bodies integrate these models into top-down methods, which further oversimplify problems and do not consider communities' disparate needs, existing resources, and health goals. Their unsustainable nature can also exacerbate health inequities by increasing dependency on external organisations, creating clients rather than agents of change.

> "These inadequate yet widespread methods exist against a backdrop of inefficient and obscure data collection, calling for an overhaul to the system."

These inadequate yet widespread methods exist against a backdrop of inefficient and obscure data collection, calling for an overhaul to the system. These factors have made current health frameworks almost entirely inaccessible to the people they are trying to help.

2 New thinking for global health

2.1 THE THEORETICAL GROUNDING OF STEMA

Stema has conducted several analyses on the approaches and philosophies behind public health research, laying a foundation of theory for fieldwork. The following section comprises a short summary of the ideas that are central to Stema's work on community health, which is centred on extreme or low-resource settings where health inequity is most prevalent. 'Low-resource settings' as an umbrella term implies a certain homogeneity, which is reductive and relies on assumptions of what resources are low and why they might be this way; whilst all low-resource settings are different, common themes among them include suboptimal healthcare service delivery, underdeveloped infrastructure, financial pressure, restricted social resources, and other factors that can contribute to poor health (van Zyl et al., 2021). There are very few communities that are inherently low-resource settings, but many are forced to be this way due to marginalisation and inequitable distribution of power and resources. The diversity seen among low-resource settings, as outlined by van Zyl and colleagues, makes it even more important to treat cases with individual consideration and respect.

The use of the term 'extreme settings' is used by Stema to describe areas where geographic remoteness, intentional exploitation, social inequity and underrepresentation in political decision-making create an environment of 'extreme' vulnerability (Wisner & Luce, 1993). The following theories are applicable anywhere, but are viewed through Stema's particular lens of working in extreme settings.

Assets
Building blocks of health, including material and non-material resources

Capacities
What communities can *do* with a set of building blocks

Capabilities
What communities have the *potential to do* now or at a future time with a set of building blocks and opportunities
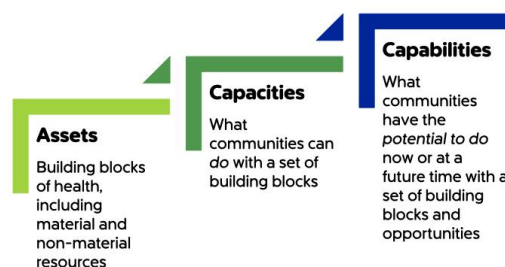
Figure 1: Diagram summarising the key points of asset-based, capacity building, and capabilities approaches, adapted with permission from Peters et al., 2021.

2.1.1 Agentic approaches

Agentic approaches present an alternative to deficit-based and top-down approaches in which the focus is on helping communities to achieve their own health goals, rather than ones assigned to them, whilst using their existing resources to their full potential. Sen defined an agent as someone who acts and causes change, and whose achievement is based on their own personal goals, as opposed to a patient, who is a passive recipient of risk (Sen, 1999). There has been an abundance of research into health promotion that could be considered agentic, with the result that separate but related schools of thought have convergently evolved, summarised in Figure 1.

"Prioritising individual goals and freedom rather than prescriptive health figures would be a radical step away from the standard of top-down health interventions."

The capabilities approach is a school of thought foundationally theorised by Amartya Sen and Martha Nussbaum on freedom and quality of life. It aims for a world in which everyone has the capability to choose to be or do whatever they like; the emphasis is on choice rather than specific achievements, as fulfilment can manifest disparately for different people (Nussbaum & Sen, 1993). The capabilities approach was the first example of an agentic approach, and caused significant and positive changes to the way that poverty was conceptualised. Sridhar Venkatapuram applied the capabilities approach to public health, arguing that health is a meta-capability that can be conceptualised as a person's ability to lead a minimally good, flourishing, and non-humiliating life (Venkatapuram, 2011). Prioritising individual goals and freedom rather than prescriptive health figures would be a radical step away from the standard of top-down health interventions.

Capacity-building approaches focus on building the knowledge, resources and skills contributing to health that are held within a social and environmental context (Easterling et al., 1998). Rather than focusing on objects that contribute to health, they instead consider the process of building health. An example of this is community mobilisation, in which members regularly plan, carry out, and evaluate activities that will improve their health and other needs. It uses participation, partnerships, and shifting patterns of power to create a reflective cycle that aims to emancipate people from health inequity (Campbell, 2014).

Capacities for health have a considerable overlap with those that contribute to community building more generally, which has often led to "community capacity" being non-specifically introduced as a goal for schemes promoting top-down health priorities. The alluring promise of community-building often ensures that these schemes will be complied with, without considering or enacting local health goals (Gibbon et al., 2002). Although capacity-building methods are a significant improvement on deficit-based approaches, they also fail to address the structural causes of health that perpetuate inequality, focusing only on the innate characteristics of communities. Capacity-based methods place the burden of change on the most disadvantaged people, who may end up facing blame for not 'choosing' to be healthy (Friedli, 2013). Despite this, capacities are a valuable concept to consider in health interventions, as their development allows long term benefits that last beyond the timespan of the intervention.

"Mapping assets and empowering
communities to fully use what they have
is a valuable approach, but not without
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poor health in the first place."

Asset-based approaches focus on the potential that people have, building on the idea that everyone has assets that nurture health, whether these are physical, social, or unrelated to traditional negative concepts of health. They aim to empower people to acknowledge and take control of these assets, making plans for the future based on their health goals (Mathie & Cunningham, 2003). Despite having had positive effects in many case studies, asset-based approaches fall under criticism for once again placing the burden of change on those who are least advantaged in society. There is the underlying implication that anyone can pull themselves out of ill health with enough strategic or hard work, without addressing the structural inequality that affects health unfairly for people living in poverty. They also have a risk of suggesting 'helicopter assets' as solutions, or ones that are provided (often temporarily) by those conducting the intervention (Friedli, 2013). Mapping assets and empowering communities to fully use what they have is a valuable approach, but not without addressing the inequities that lead to poor health in the first place.

When salutogenesis is studied rather than deficit-focused solutions, greater consideration is given to the building blocks of health and preventing illness from happening in the first place. When the dialogue around health moves away from risk factors, people can think more about the social processes and

power that affect health. This paves the way for the creation of communities who are active agents in their health, rather than passive beings that experience statistical biomedical risk, linking agentic approaches with the theory of positive health (Peters et al., 2021).

2.1.2 Resourcefulness for community health

"Resourcefulness acknowledges that
uneven distribution of assets and power
mean that the changes needed for
health are both social and political."

The concept of resourcefulness evolved as a critical response to the limitations of resilience, a term overused in many areas of politics and activism. Relying on nondescript resilience, much like top-down approaches, places the onus of survival on disadvantaged groups in the face of unfair and exploitative processes such as capitalism (MacKinnon & Derickson, 2013). Resourcefulness, rather than forcing communities to show resilience and survive through global issues, makes an issue of the uneven distribution of resources and inability of disadvantaged groups to bring about social change. It aims for a vision in which existing power relations can be meaningfully challenged (MacKinnon & Derickson, 2013). Unlike top-down approaches, resourcefulness is adapted to local priorities with the corresponding learning and development required. It aims to mobilise resources, skills, and knowledge (including folk and traditional) alongside recognition of the inequity in enabling change. Resourcefulness acknowledges that uneven distribution of assets and power mean that the changes needed for health are both social and political.

From the above philosophies, community health promotion should work towards agency in deciding and achieving local health goals, in a process that does not characterise areas by their shortcomings and also challenges the structural constraints of health. Peters and colleagues (2021) applied the concept of resourcefulness to community health to expand this idea to acknowledge the inherent inequity that exists in current global health. Resourcefulness theory provides insight into some of the issues with agency-based approaches: resources, sustainability, self-determination, and diversity.

Whilst agentic approaches generally expect communities to make do with what they already own, resourcefulness acknowledges that material resource distribution is neither equitable nor fair. Some natural resources are

necessary for health promotion, but where these are used, they should be extracted in a way that is regenerative and contributing to local human-environment relationships; if natural resources are extracted beyond repair, they can no longer act as a health asset. Economic growth at the cost of degraded natural resources is not a solution for sustainable health, and may in fact cause more harm than good (Peters et al., 2021).

Agentic approaches focus greatly on independence, which is unhelpful in situations where one community simply does not have the resources that another may have. Resourcefulness calls for interdependence and connection, both between those with similar health goals ('horizontal') and those with differing power or influence ('vertical'). When groups link together, they are much more likely to be able to meaningfully challenge existing power relations. This is one of the main features of resourcefulness (MacKinnon & Derickson, 2013; Peters et al., 2021).

Where agentic approaches wrongly see communities as unified collectives with shared goals, resourcefulness appreciates their heterogeneity and diversity, seeing it as a strength (MacKinnon & Derickson, 2013; Walmsley, 2006). A wealth of different knowledge and perspectives can produce greater capacity to innovate and initiate successful collective action. Strategic partnerships could also expand this diversity of knowledge.

While appreciating and respecting local priorities, it is important to not overly romanticise them, as any group contains heterogeneity, people with louder voices, and people who may benefit more from interventions. Local agendas may even be regressive or reinforce inequities, which would be far from the intentions of a health intervention. Partnerships and multiple sources of data are therefore key to creating the best collective outcomes.

With these insights in mind, Peters and colleagues propose a multi-pronged approach for promoting sustainable community health. This strategy aims to cultivate power between partners to achieve positive health (Peters et al., 2021).

   a. Communities conceptualise what their health and health assets are
   b. Communities pursue and sustain health agendas based on local priorities, needs, and learning
   c. Approaches change power imbalances that drive inequitable patterns of material resource distribution necessary for health
   d. Communities nurture ecologically sound and meaningful relationships with the local environment

In the same study, Peters and colleagues propose a list of suggestions for how external practitioners and policymakers can practically implement resourcefulness into community health strategies. The conversation is centred around trust, support, and creating long-term relationships. Using these suggestions, policymakers can complement rather than replace existing community health strengths (Peters et al., 2021).

To bring more of these principles into the mainstream, it is necessary to find ways of drawing positive health and community health out of abstract theory and into practice, as has been done with resourcefulness. This may look like communities mapping their assets to identify building blocks for health before planning interventions, or positive health concepts being included in official health measurement schemes. There is potential for both communities and authorities to engage with these theories in ways that can support their health to thrive.

2.2 DISRUPTING THE LANDSCAPE OF GLOBAL HEALTH

"Stema aims to change the way in which
health measurement and interventions
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agentic approaches."

Stema aims to change the way in which health measurement and interventions are developed, centring community positive health, resourcefulness and agentic approaches. A systematic reconstruction of global health principles should hold these theories close, rethink the way that data is collected, and apply modern data science techniques. There is real potential to reshape the flawed landscape of global health.

2.2.1 Making a tool for everyone

Health interventions would be improved by the involvement of community and local agendas, rather than purely top-down decisions. Stema aims to marry top-down and bottom-up approaches, so that communities become active agents in their own healthcare in a way that is respected by governing authorities.

An exemplary tool that has achieved this is the Indigenous Navigator, as shown in Table 2. It is both a framework and set of tools designed to help Indigenous peoples monitor the implementation of their rights. The tools create outputs that are aligned with the Sustainable Development Goals (SDGs) and UN Declaration on the Rights of Indigenous Peoples (UNDRIP), along with other influential top-down schemes. Referencing global healthcare strategies makes local authorities far more likely to be held accountable due to global pressure, and gives marginalised people a louder voice. In a similar light to this, Stema aims to make tools which maximise benefit by consulting community members and local stakeholders, and building on existing global health priorities. It is possible to both respect global agendas and aim to improve them with added insights and innovations from Stema's research.

Participatory research, although necessary for marginalised voices to be heard, is vulnerable to bias from those both inside and outside the community. Inequitable power relations between community participants as well as between the researchers and the community are almost inevitable. Meriläinen et al., with Stema, have presented an analytical framework for

unpacking these complex relationships in the context of the uneven effects of climate change on health (Meriläinen et al., 2021). Several models for participatory research are discussed and the most ethical ways to deal with unavoidable power imbalances are considered. Future researchers can use this framework to examine the impact of their own participatory research on power in marginalised communities (Meriläinen et al., 2021).

2.2.2 Disrupting data collection and analysis

"The current methods of data collection for global health are extractive, often opaque, and do not make the resulting data available to the people being surveyed."

The current methods of data collection for global health are extractive, often opaque, and do not make the resulting data available to the people being surveyed. A promising solution to this issue is to create a tool for crowdsourcing data; developing this tool is one of the long-term aims of Stema. If individuals have ownership over their data, the influence and potential bias of external researchers can be reduced, empowering those in the community by creating an information feedback mechanism. Given adequate governance, independent data collection would also have the potential to speed up health interventions, allowing the community to demonstrate their needs to policymakers without waiting to be deemed vulnerable enough to require an investigation, but not so much that they are seen as a poor investment environment. This solution cannot come from sophisticated technology alone, but must primarily find ways for communities to own and use their data in ways that serve them and their positive health.

Geospatial data is a novel method of data collection with great information density that shows trends in physical landscapes and built environments, and has not yet been applied to health measurement frameworks. Collected through multiple methods including remote satellite sensing, it can map changes in the landscape that may contribute to health. Spatial analysis can reveal trends such as natural resource extraction and degradation, proximity of communities to resources, and the unequal geographical distribution of the physical effects of climate change. Although geospatial data may seem unbiased, it is still interpreted by humans and is thus subject to the perspectives of the researchers using it. Alone, it can provide insights on

changes that expand beyond a community's direct and current experience. When combined with participatory research, the potential to situate and make sense of this data is increased. Environmental changes are not inevitable events that neutrally happen in isolation, but are influenced heavily by social factors (Soja, 2010; Weigand et al., 2019). Environmental change is caused by different communities to those that suffer the effects, an unjust relationship that can only be fully understood if participatory research is used to supplement geospatial methods such as satellite sensing (Brulle & Pellow, 2006).

Stema additionally aims to improve the way that community health data is quantified, moving away from only using household questionnaires. As well as centring participatory methods to quantify social characteristics, as has been demonstrated by OPHI in their research into missing dimensions of poverty (Alkire, 2007), more recent computer science techniques could be used in the field of global health. An example of this is the currently untapped potential to utilise photography and video data, as they can be seamlessly and continuously collected after an initial supply of resources. Computer vision, a field of Artificial Intelligence (AI), can analyse these data with increasing ease to derive meaningful information from them. This could allow photography to be used as more than just a talking point or to spread awareness, as it is currently used in global health. Computer vision is already able to detect complex issues in the condition of built structures, and in the assessment of biomedical data, so it is feasible that it could be used for tracking resources and infrastructure related to community health (Dong & Catbas, 2021; Esteva et al., 2021).

Advances in data science and AI have the potential to improve analysis and prediction in the space of global health. One of the issues discussed above is the lack of health frameworks that include indicators beyond basic biometric measurements – recent developments in data science could be applied to qualitative data about positive measures of health with the goal of creating quantitative indicators. Methods in the family of classification prediction can isolate statistically significant concepts from lengthy survey responses, mitigating mismatches between survey questions and response options.The likely complex findings could be efficiently collated using methods derived from Singular Value Decomposition (SVD) (Su & Khoshgoftaar, 2009). SVD-derived techniques can also enable prediction from sparse datasets, something that could be useful in settings where not everyone has access to data collection infrastructure (Schmidt, Nov 2020). Another potential goal in this space could be to create comprehensive and comparable indices from differing datasets. One of Stema's long-term goals is to utilise data science advancements such as these to improve the efficiency of global health

analysis, using best practices to develop and deploy governance frameworks, as well as making sure that the analysis is representative and meaningful.

3 Conclusion

"Fusing participatory methods with
other areas and tools of research has the
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communities to thrive."

At present, authorities overlook aspects of community positive health that contribute to wellbeing, prioritising individual biomedical metrics. Health is conceptualised and measured in a deficit-based manner, placing disadvantaged or low-resource communities in an unnecessarily negative light, inviting blame by characterising people in terms of their shortcomings. The majority of organisations in global health fail to recognise the inherent value and potential of community health and practise top-down approaches that keep the decision-making, agency, and distribution of power away from those closest to the issue.

Stema aims to disrupt this global health orthodoxy by centring communities and resourcefulness. Fusing participatory methods with other areas and tools of research has the potential to create truly innovative approaches to understanding, measuring, and ultimately pursuing health in ways that uplift and support communities to thrive. Appreciating local assets, as well as the structural constraints that contribute to health inequity, will enable a more realistic and sustainable approach to health interventions that builds and relies on long-term partnerships. Combining this with community ownership of data and involvement in decision-making will significantly increase the agency of people who have previously been disregarded by top-down approaches.

Fully utilising advances in data science and technology to reshape the way data is collected and analysed will allow the streamlining of health measurement and reporting, targeting and speeding up health interventions where they are most needed. It is time that health organisations stop intervening in paternalistic ways and start working towards bringing power, agency, and positive health to those who have been let down by the current system.

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