
Exploring the Relationship between Socioeconomic Status and Health Outcomes in Saudi Arabia

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Abstract:

The relationship between socioeconomic status (SES) and health outcomes in Saudi Arabia is increasingly gaining attention as the country strives for improved public health policies amidst rapid modernization. Research indicates that individuals from lower socioeconomic backgrounds experience higher rates of chronic diseases and limited access to healthcare services. Factors such as income level, education, and employment status play critical roles in health disparities, affecting everything from nutrition and lifestyle choices to the ability to seek timely medical care. Moreover, urbanization and shifts in traditional social structures have altered health dynamics, necessitating a closer examination of how these changes impact various demographic groups within the kingdom. Additionally, cultural perceptions regarding health can further exacerbate health inequalities linked to socioeconomic status. In Saudi Arabia, where healthcare is provided mostly by the government, access might still be unequal, with rural populations and lower-income groups facing barriers to quality care. Understanding these disparities is essential for developing targeted interventions that not only address the immediate health needs but also the underlying socioeconomic factors. By prioritizing inclusive healthcare policies and community health programs, Saudi Arabia can work towards reducing health inequalities and improving the overall well-being of its population, regardless of their socioeconomic standing.

Keywords: Socioeconomic Status, Health Outcomes, Saudi Arabia, Health Disparities, Chronic Diseases, Access to Healthcare, Urbanization, Cultural Perceptions, Health Inequalities, Community Health Programs.

Introduction:

In recent decades, the Kingdom of Saudi Arabia has undergone rapid transformations due to economic growth, urbanization, and significant investments in healthcare infrastructure. These advancements have positively impacted the overall health of the population; however, disparities in health outcomes remain pronounced across different socioeconomic strata. The relationship between socioeconomic status (SES) and health outcomes is a critical area of

research that has gained increasing attention in public health discourse globally, and Saudi Arabia is no exception. This burgeoning field investigates how factors such as income, education, and occupation influence individual and community health, thereby reflecting broader societal inequalities [1].

Socioeconomic status serves as a multifaceted determinant of health, influencing access to healthcare resources, lifestyle behaviors, and

exposure to risk factors. In Saudi Arabia, significant variations in SES are influenced by numerous factors including regional disparities, cultural norms, and the structure of the economy. As a nation characterized by both affluence and poverty, with its wealth concentrated in certain sectors, it is crucial to understand how these socioeconomic differences manifest in health outcomes. Recent studies have indicated that individuals from lower socioeconomic backgrounds are disproportionately affected by chronic diseases, mental health issues, and inadequate access to healthcare services, suggesting a direct correlation between SES and health status [2].

Saudi Arabia's distinct demographic landscape further complicates the relationship between SES and health outcomes. The population is comprised of Saudi nationals as well as a large expatriate workforce, with varying levels of income, education, and social support. Moreover, the rapid adoption of Western lifestyles among certain segments of the population has led to shifts in health-related behaviors, resulting in an increase in lifestyle-related diseases such as diabetes and cardiovascular conditions. These emerging health patterns require a nuanced understanding of how socioeconomic factors influence health behaviors, beliefs, and access to preventive and curative care [3].

The significance of investigating the relationship between SES and health outcomes in Saudi Arabia extends beyond academic inquiry; it has direct implications for health policy, resource allocation, and the overall efficacy of public health initiatives. The Saudi government has made substantial commitments to improve healthcare accessibility and equity, as evidenced by its initiatives under the Vision 2030 reform plan. This ambitious blueprint seeks to enhance the quality of life for all citizens, underscoring the need for targeted strategies that address the unique challenges faced by individuals from lower socioeconomic backgrounds. Understanding the intricate dynamics of SES and health outcomes will provide vital insights that can guide policy formulations and health interventions aimed at reducing health disparities [4].

Moreover, the integration of interdisciplinary approaches – encompassing sociology, economics, public health, and policy studies – is essential to gain a comprehensive understanding of how SES affects health outcomes in Saudi Arabia. Numerous studies

and reports have shed light on the general trends; however, there remains a considerable gap in localized, detailed research that captures the unique cultural and social contexts of different regions within the Kingdom. By illuminating the relationship between socioeconomic factors and health, this area of research can also serve as a catalyst for community engagement and empowerment, fostering greater health awareness and enabling individuals to make informed decisions regarding their well-being [5].

Current Health Profile of Saudi Arabia:

Saudi Arabia, a nation characterized by its vast deserts, rich cultural heritage, and significant economic resources, has made remarkable strides in improving the health profile of its population over the past few decades [6].

The health indicators of Saudi Arabia reflect significant advancements in various areas, particularly in maternal and child health, infectious disease control, and life expectancy. According to the World Bank, the life expectancy at birth in Saudi Arabia was approximately 75 years as of 2020, which represents a considerable increase from previous decades. This improvement can be attributed to enhanced healthcare services, increased awareness of health issues, and better living conditions [7].

Infant mortality rates have also declined significantly, from 60 deaths per 1,000 live births in the early 1990s to around 8 deaths per 1,000 live births in recent years. This decrease is largely due to improved maternal healthcare, vaccination programs, and access to neonatal care. The country has also made substantial progress in addressing communicable diseases, with vaccination campaigns effectively reducing the incidence of diseases such as polio, measles, and hepatitis [8].

However, while these indicators show positive trends, they also highlight emerging challenges, particularly in the realm of non-communicable diseases (NCDs). The prevalence of conditions such as diabetes, cardiovascular diseases, and obesity has surged in recent years, raising concerns about the long-term health implications for the population [9].

One of the most pressing health challenges facing Saudi Arabia is the rising prevalence of NCDs. According to the Saudi Ministry of Health, diabetes affects approximately 30% of the adult population,

making it one of the highest rates globally. This alarming statistic is compounded by high rates of obesity, which have been attributed to sedentary lifestyles, poor dietary habits, and a lack of physical activity. The World Health Organization (WHO) has classified obesity as a significant public health issue in Saudi Arabia, with over 60% of adults classified as overweight or obese [10].

Cardiovascular diseases are another significant concern, as they are the leading cause of death in the country. Factors contributing to this trend include high rates of smoking, unhealthy diets, and a lack of awareness regarding heart health. The Saudi government has recognized the need to address these issues and has implemented various public health campaigns aimed at promoting healthier lifestyles and reducing the risk factors associated with NCDs [11].

Mental health is another area that has garnered increased attention in recent years. Traditionally, mental health issues have been stigmatized in Saudi society, leading to underreporting and inadequate treatment. However, the government has taken steps to improve mental health services, including the establishment of specialized clinics and increased funding for mental health programs. The COVID-19 pandemic has further highlighted the importance of mental health, with many individuals experiencing heightened levels of anxiety and depression [12].

Saudi Arabia boasts a well-developed healthcare infrastructure, characterized by a combination of public and private healthcare facilities. The country has made significant investments in healthcare, resulting in the establishment of numerous hospitals, clinics, and specialized medical centers. The Ministry of Health is responsible for overseeing public health services, while private healthcare providers play a crucial role in delivering care to a growing population [13].

The healthcare system in Saudi Arabia is primarily funded by the government, which provides free healthcare services to citizens. This model has facilitated access to essential medical services, including preventive care, treatment for chronic diseases, and emergency services. However, challenges remain in ensuring equitable access to healthcare, particularly in rural areas where facilities may be limited [13].

In recent years, the government has initiated reforms aimed at improving the efficiency and quality of

healthcare services. The Vision 2030 initiative, launched in 2016, emphasizes the importance of enhancing healthcare delivery, promoting health awareness, and encouraging the private sector's involvement in healthcare services. This initiative aims to create a more integrated healthcare system that prioritizes patient-centered care and preventive health measures [14].

The Saudi government has implemented various initiatives and policies to address the evolving health challenges facing the nation. One of the key strategies has been the promotion of healthy lifestyles through public health campaigns. These campaigns aim to raise awareness about the risks associated with unhealthy behaviors, such as poor diet, physical inactivity, and smoking. The "Healthy Lifestyle" initiative, for example, encourages citizens to adopt healthier eating habits and engage in regular physical activity [15].

Additionally, the government has focused on improving access to healthcare services, particularly for vulnerable populations. Efforts have been made to enhance maternal and child health services, with an emphasis on prenatal care, family planning, and vaccination programs. The establishment of community health centers has also played a vital role in providing primary care services to underserved areas [15].

The COVID-19 pandemic has further accelerated the government's focus on public health. Saudi Arabia implemented strict measures to curb the spread of the virus, including widespread testing, contact tracing, and vaccination campaigns. The successful rollout of the COVID-19 vaccine has been a significant achievement, with a large percentage of the population vaccinated within a relatively short period [16].

The rapid urbanization and economic development experienced by Saudi Arabia in recent decades have led to significant lifestyle changes that have impacted public health. The shift from traditional diets to more Westernized eating habits, characterized by high consumption of processed foods, sugars, and fats, has contributed to the rising rates of obesity and related health issues. Additionally, increased reliance on technology and sedentary occupations have reduced physical activity levels among the population [17].

To combat these lifestyle-related health challenges, the government has emphasized the importance of

health education and promotion. Schools, workplaces, and community organizations are increasingly involved in initiatives aimed at encouraging physical activity and healthy eating. Moreover, the integration of health education into school curricula has been recognized as a vital step toward fostering a culture of health among the younger generation [18].

Socioeconomic Determinants of Health:

Health is a multifaceted concept influenced by a variety of factors including genetics, behavior, and environment. Among these, socioeconomic determinants play a crucial role in shaping the health outcomes of individuals and populations. Understanding these determinants is essential for public health initiatives, policy-making, and aimed at addressing the disparities that often exist between various social groups [19].

What are Socioeconomic Determinants of Health?

Socioeconomic determinants of health encompass a wide range of social and economic factors that influence an individual's health status. These factors include, but are not limited to, income, education, employment status, social environment, and access to healthcare services. The World Health Organization (WHO) defines these determinants as the conditions in which people are born, grow, live, work, and age, and highlights that they contribute significantly to health disparities [20].

1. **Income and Wealth:** One of the most significant socioeconomic determinants is income. Higher income levels often correlate with better health outcomes. Individuals with more resources can afford healthier lifestyles, including a balanced diet, regular exercise, and access to preventive care. Conversely, lower income is associated with increased stress, limited access to nutritious food, and a higher likelihood of engaging in riskier health behaviors such as smoking and excessive alcohol consumption [21].
2. **Education:** Education is another critical socioeconomic factor. Higher educational attainment is linked to better health outcomes, whether through enhanced health literacy, increased employment opportunities, or greater access to

healthcare services. Educated individuals are more likely to comprehend health information and to utilize health services effectively, leading to early detection and treatment of medical conditions [22].

3. **Employment:** Employment status and working conditions also serve as vital determinants of health. Employment provides not only income but also access to benefits such as health insurance. Job security and favorable working environments contribute to mental and physical wellness. On the other hand, job-related stress, unemployment, or underemployment can negatively impact health, leading to issues such as anxiety, depression, and physical ailments [22].
4. **Social Support:** The social environment, including social networks and community ties, significantly influences health outcomes. Strong social support can lead to improved mental health and better coping strategies during times of stress. Conversely, social isolation has been linked to negative health outcomes, including increased mortality rates. Community cohesion fosters a sense of belonging, facilitating access to resources and support that can mitigate health risks [23].
5. **Access to Healthcare:** Access to healthcare services is a crucial determinant of health. Individuals in lower socioeconomic groups often face barriers to accessing healthcare, including financial constraints, lack of insurance, transportation issues, and limited availability of services in their communities. Insufficient access to preventive care can lead to the late-stage diagnosis of diseases, which is associated with poorer health outcomes [24].
6. **Physical Environment:** The physical environment, including housing conditions, neighborhood safety, and the availability of recreational spaces, is another crucial aspect of health. Poor housing conditions can lead to health problems such as asthma, lead poisoning, and mental health issues. Neighborhoods with limited access to parks and

recreational facilities can hinder physical activity, contributing to obesity and related health conditions [25].

Impact of Socioeconomic Determinants on Health Outcomes

The interplay of these socioeconomic determinants results in substantial health disparities among different populations. Low-income individuals, racial and ethnic minorities, and those with lower educational attainment often experience poorer health outcomes compared to their more affluent counterparts. For instance, chronic diseases such as diabetes, hypertension, and cardiovascular diseases disproportionately affect populations with lower socioeconomic status [26].

Moreover, disparities in health are not limited to physical well-being. Mental health issues are magnified in disadvantaged communities where stressors such as economic hardship, inadequate housing, and social isolation are prevalent. These psychological burdens can further hinder an individual's ability to seek care, perpetuating a cycle of poor health [26].

A critical aspect of examining socioeconomic determinants is the concept of intersectionality, recognizing that overlapping social identities (such as race, gender, and class) further compound health inequalities. For example, a low-income individual from a marginalized racial or ethnic group may face compounded challenges in accessing quality healthcare, thus exacerbating health disparities [27].

Addressing Socioeconomic Determinants of Health

Addressing the socioeconomic determinants of health requires a multifaceted approach. Public health initiatives must move beyond focusing solely on individual behaviors and medical care to encompass broader social policies and systemic changes. Key strategies include:

1. **Policy Interventions:** Policymakers must create equitable policies that address income inequality, improve educational opportunities, and enhance access to healthcare. Living wage initiatives, affordable housing programs, and expansions in public transportation can significantly impact the socioeconomic factors influencing health [28].
2. **Community Engagement:** Engaging communities in health promotion efforts fosters an environment where individuals are informed and can advocate for their health needs. Community-based approaches, such as health education programs and grassroots initiatives, can empower individuals to take control of their health and well-being.
3. **Collaborative Approaches:** Collaboration between healthcare providers, social services, and community organizations is essential to address the root causes of health disparities. Integrating health services with social support systems can provide holistic care that meets individuals' comprehensive needs [28].
4. **Research and Data Collection:** Continued research into the socioeconomic determinants of health is vital to understand their impact fully. Data collection efforts can highlight the disparities present in communities, guiding targeted interventions and resource allocation [29].

Impact of Urbanization on Health Disparities:

Urbanization refers to the increasing population concentration in cities and urban areas, a phenomenon that has accelerated dramatically in recent decades. As of 2021, more than half of the world's population resides in urban environments, a trend projected to rise to nearly 68% by 2050. While urbanization holds the promise of economic growth and improved living conditions, it also presents significant challenges, particularly concerning health disparities among various population groups [30].

First, it is essential to acknowledge the potential benefits of urbanization. Urban areas often provide access to better healthcare facilities, educational opportunities, employment prospects, and infrastructure, which can contribute to improved health outcomes on a macro scale. For instance, cities typically have more hospitals and specialized medical practitioners compared to rural areas, which can enhance the prevention, diagnosis, and treatment of various health conditions. Moreover, urban environments often offer improved sanitation, clean water access, and healthier food options,

reducing the burden of communicable diseases and malnutrition [31].

Economic opportunities in urban centers can lead to greater socioeconomic mobility, which is linked to better health outcomes. Individuals with higher income levels tend to have improved access to healthcare services, nutritious food, safe housing, and education—factors that contribute to overall better health. Furthermore, urbanization encourages social connectivity and cultural exchange, which can foster mental well-being and reduce feelings of isolation [32].

Despite the potential benefits that urbanization offers, it can also exacerbate existing health disparities. The concentration of wealth and resources in urban environments has resulted in stark inequalities in health outcomes, particularly among marginalized populations, ethnic minorities, and low-income communities. These groups often experience barriers to healthcare access, lower quality services, and higher rates of chronic diseases compared to their more affluent counterparts [33].

One critical factor contributing to health disparities in urban settings is socioeconomic inequality. Wealthy neighborhoods tend to have better access to healthcare facilities, cleaner environments, and healthier lifestyle options, while poor urban areas often suffer from neglect and a lack of resources. For instance, low-income communities are more likely to be located in areas with higher pollution levels, inadequate public transportation, and limited access to parks and recreational spaces. These environmental stressors can lead to higher incidences of respiratory diseases, obesity, and related conditions among residents [34].

Moreover, urbanization often fosters social stratification, leading to increased crime rates and violence in disadvantaged neighborhoods. This environment can create a sense of hopelessness and result in mental health issues such as anxiety and depression. Studies show that factors such as social isolation, violence, and instability can significantly impact mental health, leading to poor physical health outcomes over time [35].

The manner in which cities are planned and developed plays a critical role in shaping health outcomes and disparities. Urbanization that prioritizes economic growth over equitable development can lead to the gentrification of certain neighborhoods, displacing low-income residents

and disrupting social networks. Gentrification, while creating new economic opportunities, often results in rising housing costs and a corresponding loss of affordable housing for longstanding residents [36].

Additionally, urban sprawl often leads to inadequate public transportation systems, making it difficult for low-income individuals to access jobs, education, and healthcare. This lack of accessibility can lead to decreased physical activity, poorer diet choices, and increased morbidity rates among vulnerable populations. Furthermore, the design of urban environments—such as the absence of sidewalks, parks, and public recreational areas—can discourage physical activity, contributing to obesity and other diet-related health issues [37].

Solutions to Mitigate Health Disparities

To address health disparities in urban areas, a multi-faceted approach is necessary. Policymakers and urban planners must prioritize the creation of inclusive, equitable environments that consider the needs of all residents. Essential strategies include:

1. **Equitable Urban Planning:** Developing urban spaces that are intentionally designed to reduce inequities is vital. This includes integrating affordable housing options, improving public transportation networks, and ensuring that essential services—such as healthcare, education, and grocery stores—are accessible to all communities [38].
2. **Community Engagement:** Involving local communities in the decision-making processes regarding urban development is crucial. Policymakers should seek input from residents to ensure that their needs and preferences are incorporated, fostering more sustainable and supportive environments.
3. **Infrastructure Investment:** Investing in infrastructure that promotes health—such as parks, walking trails, and recreational facilities—can help encourage physical activity and improve residents' quality of life. Moreover, reducing pollution and enhancing public transportation can further support well-being [38].
4. **Healthcare Access:** Expanding access to healthcare services, particularly in

underserved urban areas, is essential. This could involve the establishment of community health centers, increased funding for mental health services, and innovative telehealth solutions to improve care accessibility.

5. **Education and Outreach:** Health education initiatives focusing on preventive care, healthy lifestyles, and nutrition can empower residents to make informed decisions about their health. Public health campaigns should target specific populations and address cultural and linguistic barriers to ensure effectiveness [39].

Barriers to Healthcare Access in Diverse Communities:

Access to healthcare is a fundamental human right, yet it remains an elusive goal for many diverse communities around the world. Various barriers hinder equitable healthcare access, leading to significantly disparate health outcomes among different populations. These barriers can be grouped into several categories, including socio-economic factors, cultural and linguistic differences, geographic location, healthcare system complexities, and policy-related issues. Understanding these barriers is essential for developing strategies that promote equitable healthcare access for all, particularly in communities that experience systemic disadvantages [40].

One of the primary barriers to healthcare access is socio-economic status. Individuals from low-income backgrounds often face considerable financial obstacles that prevent them from seeking necessary medical care. High uninsured rates are prevalent among economically disadvantaged communities, leaving them vulnerable to exorbitant out-of-pocket costs. Even for those with insurance, high deductibles and copayments can deter individuals from accessing essential services [40].

Furthermore, many individuals in these communities may be employed in low-wage jobs that do not provide reliable health benefits, exacerbating economic insecurity and increasing the likelihood of health complications that could have been prevented with timely intervention. This cycle of poverty is often reinforced by inadequate access to education and information about health services, which can lead to greater health disparities [41].

Cultural factors play a significant role in shaping how different communities perceive health, illness, and the healthcare system. In diverse populations, cultural beliefs and practices may influence attitudes towards medical treatment, resulting in reluctance to engage with healthcare providers. For instance, some individuals may prefer alternative medicine or traditional healing practices, leading them to avoid conventional medical care altogether [42].

Language barriers further complicate access to healthcare for non-native speakers. Effective communication between healthcare providers and patients is critical for accurate diagnosis, understanding treatment options, and adhering to medical advice. When patients cannot communicate their symptoms effectively or comprehend the instructions given by their providers, it can result in misdiagnosis, inappropriate treatment plans, and poor health outcomes. In communities with limited access to translators and interpretation services, individuals may feel vulnerable and reluctant to seek help [42].

Geographic location significantly impacts access to healthcare services, especially for rural and remote communities. In many rural areas, healthcare facilities may be scarce, with few primary care physicians, specialists, and hospitals available. Long-distance travel to obtain medical care can pose challenges for people who lack transportation or have limited mobility, such as the elderly or disabled individuals [42].

Urban areas, while often having more healthcare resources, can also present barriers in the form of overcrowded facilities and long wait times for services. Transportation issues, including inadequate public transit systems and rising fuel costs, can hinder access to care even within urban settings. Neighborhoods with high crime rates or social instability may further discourage individuals from seeking help [43].

The complexities of the healthcare system itself can serve as a barrier to access. Navigating insurance policies, understanding benefits, and managing appointments can be overwhelming, particularly for those who lack experience with the system. Administrative burdens associated with paperwork, billing, and authorizations often create additional challenges for individuals trying to obtain care. Moreover, a lack of trust in healthcare institutions, stemming from historical injustices and

discrimination, may further deter individuals from engaging with the system [43].

Healthcare providers themselves may sometimes inadvertently contribute to access barriers. Implicit biases and stereotypes can influence the quality of care delivered to diverse populations. Patients who feel marginalized or discriminated against may be less likely to seek help or follow medical recommendations, perpetuating cycles of poor health.

Policies at both the local and national levels play a critical role in shaping healthcare access for diverse communities. Inadequate funding for public health services, especially in low-income areas, can result in under-resourced clinics and facilities that struggle to meet the needs of their populations. Additionally, policy decisions that limit Medicaid expansion or undermine public health initiatives can exacerbate inequities in care access [43].

Moreover, the complexity of healthcare policies can create confusion among individuals seeking services. Changes in eligibility requirements or benefits may lead to lapses in coverage for some individuals, leaving them without necessary resources. Policymakers must consider the unique challenges faced by diverse communities when developing and implementing healthcare policies to promote equity [44].

To address these barriers effectively, a multifaceted approach is required that incorporates community engagement, education, policy reforms, and awareness initiatives. Community health programs that are culturally and linguistically tailored can help bridge gaps in understanding and promote healthier behaviors. Increasing the number of culturally competent healthcare providers who understand the unique needs of diverse populations is critical to fostering trust and improving health outcomes [45].

Furthermore, expanding transportation services and telehealth options can help alleviate geographic barriers. By ensuring that healthcare facilities are accessible to everyone, regardless of location, policymakers can significantly improve access to care.

Investing in education and outreach initiatives can empower individuals with the information they need to navigate the healthcare system successfully. Providing resources that explain insurance options, preventive care, and available services can help

demystify healthcare access and encourage individuals to seek help when needed [46].

Additionally, systemic changes at the policy level must focus on promoting equity in healthcare access. Policymakers should prioritize funding for community health centers that serve diverse populations and advocate for policies that expand insurance coverage and benefits [47].

Public Health Policies and Socioeconomic Equity:

Public health is the science and practice of protecting and improving the health of communities and populations. Integral to this mission is the development and implementation of public health policies, which are systematic frameworks set in place to promote health, prevent disease, and improve health equity among various demographic groups. Socioeconomic equity—defined as the fair distribution of resources and opportunities across diverse social and economic groups—is a critical factor in shaping the effectiveness of public health policies [48].

Public health policies encompass a wide range of initiatives, including legislation, regulations, guidelines, and community programs aimed at enhancing health and preventing illness. These policies are informed by data from epidemiological studies, health research, and community needs assessments. They can target a variety of health issues, from communicable diseases to chronic conditions, and may address broader determinants of health such as the social, economic, and environmental factors that contribute to health disparities [49].

The goals of public health policies are multifaceted. They aim not only to reduce the incidence of disease but also to promote a higher quality of life and ensure that all individuals, regardless of their socioeconomic status, have access to the resources necessary for maintaining good health. However, without careful consideration of socioeconomic factors, these policies can inadvertently widen health disparities instead of bridging them [49].

Socioeconomic inequities in health can be attributed to a range of interconnected factors. Generally, individuals with higher socioeconomic status enjoy better access to health care, healthier living conditions, and higher levels of education. In contrast, lower-income individuals often have

limited access to quality healthcare services, nutritious food, and safe living environments. These disparities manifest in health outcomes; for instance, individuals from lower socioeconomic backgrounds are often at higher risk for chronic illnesses such as diabetes and cardiovascular diseases, as well as higher rates of morbidity and mortality [50].

Additionally, socioeconomic inequities are influenced by broader systemic issues such as racism, discrimination, and economic instability. The social determinants of health—which include factors such as education, employment, housing, and social support—are critical in determining health outcomes and must be at the forefront of public health considerations. When public health policies fail to address these determinants, they risk perpetuating existing disparities and undermining overall public health efforts [50].

Recognizing the relationship between public health policies and socioeconomic equity, various strategies can be employed to promote more just health outcomes. A fundamental approach is the implementation of health equity assessments within the policy-making process. Such assessments involve evaluating how potential policies may differentially impact health outcomes across various socioeconomic groups. By incorporating health equity assessments into the development of public health policies, policymakers can identify gaps and mitigate any adverse effects that might arise from their initiatives [51].

Another critical strategy involves engaging affected communities in the policy-making process. Community-based participatory research (CBPR) is one method in which community members collaborate with researchers to identify health issues that are of particular concern to them. This participatory model not only ensures that health initiatives are relevant and culturally appropriate but also empowers communities to play an active role in creating solutions for their health challenges. Moreover, fostering strong public-private partnerships can enhance resource allocation to underserved communities and ensure that their voices are heard during policy discussions [51].

Promoting universal health coverage (UHC) is another essential approach to ensuring health equity. UHC aims to provide all individuals with access to necessary health services without suffering financial hardship. By removing financial barriers, UHC can significantly reduce health disparities among low-

income populations. Various countries have successfully implemented UHC and witnessed improved health outcomes, reduced mortality rates, and decreased health inequalities as a result [52].

Given that social determinants play a central role in health disparities, policies that address these determinants are pivotal. Initiatives aimed at improving education, housing, nutrition, and employment can have a transformative impact on public health. For example, investing in education and job training programs helps individuals secure better employment opportunities, which can lead to improved health outcomes. Similarly, policies that facilitate access to affordable housing and nutritious food can directly enhance the health of communities [52].

Cultural Perspectives on Health and Socioeconomic Status:

The relationship between health and socioeconomic status (SES) is complex and multifaceted, influenced by an array of factors ranging from individual behavior to systemic inequities. As nations grapple with the implications of these connections, a more nuanced understanding that encompasses cultural perspectives becomes imperative. Culture shapes beliefs, practices, and expectations surrounding health and well-being, while socioeconomic status informs access to resources, healthcare, and educational opportunities [53].

Defining Health and Socioeconomic Status

Health is not merely the absence of disease but a holistic concept that incorporates physical, mental, and social well-being. The World Health Organization (WHO) defines health as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity." Socioeconomic status, on the other hand, is typically assessed through a combination of income, education, and occupation, which profoundly influences individuals' access to health resources, quality of care, and lifestyle choices [54].

Cultural norms and values play a pivotal role in shaping how societies understand and prioritize health. Perspectives on health can vary significantly across cultures, affecting attitudes toward illness, healing practices, and interactions with healthcare systems. For instance, in many Western societies, health is often equated with medical interventions,

such as pharmaceuticals and surgeries. In contrast, other cultures may emphasize holistic approaches that incorporate traditional healing practices, spiritual well-being, and community support [54].

The Influence of Culture on Health Perspectives

Culture influences perceptions of health and illness in several ways. For example, some cultures view health as a collective responsibility, where the well-being of the community is interlinked with that of the individual. In such societies, social ties and communal activities may contribute significantly to health outcomes. In contrast, cultures that prioritize individualism may emphasize personal responsibility for health, leading to different health-seeking behaviors [55].

Moreover, cultural beliefs can dictate how diseases are understood and treated. In certain traditions, illnesses might be interpreted through spiritual or supernatural lenses, where healers play a central role in diagnosis and treatment. This is evident in various indigenous cultures, where traditional medicine is deeply rooted in local beliefs and practices. Conversely, in highly urbanized and industrial societies, there may be greater reliance on scientific explanations for health issues, and individuals may gravitate toward evidence-based medical treatments [56].

Socioeconomic Status as a Determinant of Health

A significant body of research indicates that socioeconomic status is one of the strongest predictors of health outcomes. Individuals from lower SES backgrounds are generally at higher risk for chronic conditions, such as diabetes, hypertension, and heart disease. This disparity can be attributed to several interconnected factors, including limited access to healthcare, unhealthy living environments, and differing health behaviors [57].

Low-income individuals often face barriers to accessing quality healthcare, including the inability to afford medical services, lack of insurance, and poor transportation options. Additionally, those living in economically disadvantaged neighborhoods are more likely to encounter social determinants of health, such as food deserts, inadequate housing, and limited educational opportunities. These environmental factors can perpetuate a cycle of disadvantage, where

individuals are unable to break free from the conditions that adversely affect their health [58].

Intersections of Culture, Health, and Socioeconomic Status

The interplay between culture and socioeconomic status significantly influences health behaviors and access to care. For instance, cultural attitudes toward diet and nutrition can impact health outcomes related to obesity and related diseases. In some cultures, traditional diets rich in whole foods and natural ingredients contribute to better health. However, globalization and economic pressures may lead to the adoption of unhealthy eating habits, particularly among lower SES groups, as fast food becomes more accessible and culturally assimilated [59].

Mental health is another area where cultural perspectives intersect with socioeconomic factors. Stigma surrounding mental illness can discourage individuals from seeking help, particularly in cultures that prioritize stoicism or view mental health issues as a sign of weakness. Furthermore, individuals from lower socioeconomic backgrounds may face additional stressors, including financial instability and inadequate social support, exacerbating mental health challenges [60].

Implications for Public Health Initiatives

Understanding the cultural dimensions of health in relation to socioeconomic status is crucial for designing effective public health initiatives. Programs that acknowledge and incorporate cultural beliefs and practices are more likely to resonate with target populations, leading to improved health outcomes. For instance, community-based interventions that engage local leaders and utilize culturally relevant messaging can foster trust and encourage participation in health programs [61].

Additionally, addressing socioeconomic disparities must be a priority within public health strategies. This may involve initiatives aimed specifically at improving access to healthcare for underserved populations, providing education on health-promoting behaviors, and advocating for policy changes that address social determinants of health [62].

Furthermore, integrative approaches that combine traditional and modern medical practices can enhance healthcare delivery in culturally diverse communities. Such models can validate cultural

beliefs while providing access to evidence-based care, leading to more comprehensive health solutions [62].

Recommendations for Future Research and Policy:

One of the paramount recommendations for future research and policy development is to enhance collaboration across sectors. Policymakers, researchers, and practitioners often operate in silos, which inhibits the diffusion of critical knowledge and stunts innovation. Building networks that facilitate communication will create a more cohesive understanding between researchers and policymakers, allowing for research to be responsive to real-world issues [63].

To foster this collaboration, the establishment of formal partnerships is essential. This can be achieved through joint forums, workshops, and policy incubators where stakeholders can share insights, challenges, and best practices. For instance, regular briefings can bring together scientists and public officials to discuss the latest findings and their potential implications for policy. Such interactions will not only inform decision-making but also allow research agendas to reflect the needs of society [63].

Moreover, engagement with the private sector can enhance the applicability of research. Companies increasingly rely on data and scientific insights to inform their practices, making them valuable partners in the research process. For example, during the COVID-19 pandemic, pharmaceutical companies collaborated with research institutions to expedite vaccine development. This model should be emulated across various sectors, ensuring that research is grounded in practical application [64].

Complex societal issues often transcend disciplinary boundaries, necessitating a more integrated research approach. Future research should prioritize interdisciplinary collaboration to cultivate comprehensive solutions that address the multifarious nature of problems such as climate change, public health, and social inequality [65].

Interdisciplinary research teams should include experts from a range of fields—science, social science, economics, and humanities—enabling diverse perspectives to inform inquiry. For example, tackling climate change requires scientific expertise alongside economic modeling, sociocultural

understanding, and technological innovation. Programs that encourage teams to work across traditional academic silos can produce holistic strategies that incorporate diverse methods and viewpoints [66].

Academic programs should also consider revising curricula to emphasize interdisciplinary learning. This includes fostering skills in collaboration, communication, and critical thinking among students, preparing the next generation of researchers to approach problems from multiple angles. Furthermore, funding agencies should prioritize and reward interdisciplinary projects, understanding that innovation often happens at the intersection of different fields [67].

The explosion of data availability due to advancements in technology presents a unique opportunity for future research and policy-making. To harness this potential, researchers and policymakers should commit to increasingly data-driven approaches that utilize big data, artificial intelligence (AI), and machine learning [68].

Future research should not only focus on generating new knowledge but also on developing robust frameworks for data collection, analysis, and interpretation. This involves standardizing methodologies to ensure data integrity and comparability across studies. Additionally, promoting transparency and public access to data will enable independent verification of findings and foster greater public trust [69].

The integration of predictive analytics into policy-making can also be transformative. For instance, machine learning tools can create models to forecast the impact of specific policies on public health or economic factors. By anticipating outcomes, policymakers can make better-informed decisions, adapt strategies in real-time, and allocate resources more effectively [69].

Moreover, technology can play a pivotal role in community engagement. Mobile applications, online surveys, and social media platforms can facilitate data collection from diverse populations, enabling researchers to capture community needs and preferences efficiently. Such engagement can strengthen the relevance and applicability of research, empowering stakeholders to contribute to policy discourse actively [69].

As the world becomes increasingly interconnected, addressing issues related to equity and inclusivity in research and policy is paramount. Policymaking must account for the diverse experiences and needs of all community members, especially marginalized groups who often bear the brunt of inequities [70].

Future research should prioritize equity-focused studies that investigate disparities in health, wealth, and access to resources. This involves not only examining the causes of inequities but also identifying effective interventions that have successfully addressed them. Incorporating participatory research methods can further amplify the voices of underrepresented populations, ensuring their concerns inform policy decisions [71].

Understanding the socio-political context of research is also essential. Policymakers should recognize historical injustices and consider their ongoing implications when designing interventions. Policies that are sensitive to cultural differences and community dynamics are more likely to be accepted and effective. Training programs that educate researchers and policymakers about cultural competence can enhance sensitivity toward diverse perspectives [72].

Conclusion:

In conclusion, the exploration of the relationship between socioeconomic status (SES) and health outcomes in Saudi Arabia reveals significant disparities that need to be addressed through targeted interventions and inclusive policies. This study highlights that individuals from lower SES backgrounds face greater health challenges, including higher prevalence rates of chronic diseases and limited access to essential healthcare services. Factors such as education, income, and occupation are critical determinants that shape health outcomes and must be prioritized in public health strategies.

As Saudi Arabia continues to modernize and urbanize, understanding the complexities of SES and health becomes increasingly vital. Cultural perceptions and systemic barriers further complicate these issues, underscoring the necessity for tailored public health initiatives that consider the diverse needs of the population. By addressing the social determinants of health and implementing policies that promote equity, Saudi Arabia can work towards improving health outcomes for all citizens, ensuring

that advancements in healthcare reach every segment of society, thereby fostering a healthier and more equitable nation. Future research should continue to examine these relationships in greater depth and explore innovative solutions to bridge the gap in health inequalities.

References:

1. Wang Y, Monteiro C, Popkin BM. "Trends of obesity and underweight in older children and adolescents in the United States, Brazil, China, and Russia." *Am J Clin Nutr.* 2002;75:971–7. doi: 10.1093/ajcn/75.6.971.
2. Alshammari E, Suneetha E, Adnan M, Khan S, Alazzeh A. Growth profile and its association with nutrient intake and dietary patterns among children and adolescents in hail region of Saudi Arabia. *Biomed Res Int.* 2017;2017:5740851. doi: 10.1155/2017/5740851.
3. El Mouzan M, Al Herbish A, Al Salloum A, Al Omar A, Qurachi M. Regional prevalence of short stature in Saudi school-age children and adolescents? *ScientificWorldJournal.* 2012;2012:505709. doi: 10.1100/2012/505709.
4. Popkin BM, Corvalan C, Grummer-Strawn LM. Dynamics of the double burden of malnutrition and the changing nutrition reality. *Lancet.* 2020;395:65–74. doi: 10.1016/S0140-6736(19)32497-3.
5. Erismann S, Knoblauch AM, Diagbouga S, Odermatt P, Gerold J, Shrestha A, et al. Prevalence and risk factors of undernutrition among schoolchildren in the Plateau Central and Centre-Ouest regions of Burkina Faso. *Infect Dis Poverty.* 2017;6:17. doi: 10.1186/s40249-016-0230-x.
6. Al-Hussaini A, Troncone R, Khormi M, Muath AlTuraiki, Wahid Alkhamis, Mona Alrajhi, et al. Mass screening for celiac disease among school-aged children: Toward exploring celiac iceberg in Saudi Arabia. *J Pediatr Gastroenterol Nutr.* 2017;65:646–51. doi: 10.1097/MPG.0000000000001681.
7. Al-Hussaini A, Bashir MS, Khormi M, AlTuraiki M, Alkhamis W, Alrajhi M, et al. Overweight and obesity among Saudi children and adolescents: Where do we stand today? *Saudi J Gastroenterol.* 2019;25:229–35. doi: 10.4103/sjg.SJG_617_18.

8. Deurenberg P, Deurenberg-Yap M, Guricci S. Asians are different from Caucasians and from each other in their body mass index/body fat per cent relationship. *Obes Rev.* 2002;3:141–6. doi: 10.1046/j.1467-789x.2002.00065.x.
9. World Health Organization Multicentre Growth Reference Study Group. WHO child growth standards based on length/height, weight and age. *Acta Paediatr Suppl.* 2006;450:76–85.
10. Malina RM, Katzmarzyk PT. Validity of the body mass index as an indicator of the risk and presence of overweight in adolescents. *Am J Clin Nutr.* 1999;70:131S–6S. doi: 10.1093/ajcn/70.1.131s.
11. Al Alwan I, Al Fattani A, Longford N. The effect of parental socioeconomic class on children's body mass indices. *J Clin Res Pediatr Endocrinol.* 2013;5:110–5. doi: 10.4274/Jerpe.898.
12. Caulfield LE, de Onis M, Blossner M, Black RE. Undernutrition as an underlying cause of child deaths associated with diarrhea, pneumonia, malaria, and measles. *Am J Clin Nutr.* 2004;80:193–8. doi: 10.1093/ajcn/80.1.193.
13. Armstrong J, Dorosty AR, Reilly JJ, Emmett PM. Child health information T: Coexistence of social inequalities in undernutrition and obesity in preschool children: Population based cross sectional study. *Arch Dis Child.* 2003;88:671–5. doi: 10.1136/adc.88.8.671.
14. El Mouzan M, Foster P, Al Herbish A, Al Salloum A, Al Omar A, Qurachi M. Prevalence of malnutrition in Saudi children: A community-based study. *Ann Saudi Med.* 2010;30:381–5. doi: 10.4103/0256-4947.67076.
15. WHO Anthroplus version.
16. World Health Organization. Double-duty actions for nutrition: policy brief. 2017.
17. World Health Organization. Regional Strategy on Nutrition 2010–2019 and Plan of Action.
18. Ogden CL, Carroll MD, Kit BK, Flegal KM. Prevalence of childhood and adult obesity in the United States, 2011–2012. *JAMA.* 2014;311:806–14. doi: 10.1001/jama.2014.732.
19. Rolland-Cachera MF, Castetbon K, Arnault N, Bellisle F, Romano MC, Lehoucq Y, et al. Body mass index in 7-9-y-old French children: Frequency of obesity, overweight and thinness. *Internat J Obes.* 2002;26:1610–6. doi: 10.1038/sj.ijo.0802146.
20. Katona P, Katona-Apte J. The interaction between nutrition and infection. *Clin Infect Dis.* 2008;46:1582–8. doi: 10.1086/587658.
21. Matsuda S. Regulatory effects of health examination programs on medical expenditures for the elderly in Japan. *Soc Sci Med.* (1996) 42:661–70. doi: 10.1016/0277-9536(95)00197-2.
22. Al-Hanawi MK, Mwale ML, Kamninga TM. The effects of health insurance on health-seeking behaviour: evidence from the Kingdom of Saudi Arabia. *Risk Manag Healthc Policy.* (2020) 13:595. doi: 10.2147/RMHP.S257381.
23. Al-Hanawi MK, Alsharqi O, Almazrou S, Vaidya K. Healthcare finance in the Kingdom of Saudi Arabia: a qualitative study of householders' attitudes. *Appl Health Eco Health Policy.* (2018) 16:55–64. doi: 10.1007/s40258-017-0353-7.
24. Hoebel J, Starker A, Jordan S, Richter M, Lampert T. Determinants of health check attendance in adults: findings from the cross-sectional German health update (GEDA) study. *BMC Public Health.* (2014) 14:1–12. doi: 10.1186/1471-2458-14-913.
25. Al-Hanawi MK, Hashmi R, Almubark S, Qattan A, Pulok MH. Socioeconomic inequalities in uptake of breast cancer screening among Saudi women: A cross-sectional analysis of a national survey. *Int J Environ Res Public Health.* (2020) 17:2056. doi: 10.3390/ijerph17062056.
26. Chiolerio A, Paradis G, Paccaud F. The pseudo-high-risk prevention strategy. *Int J Epidemiol.* (2015) 44:1469–73. doi: 10.1093/ije/dyv102.
27. Alfqeeh G, Cook EJ, Randhawa G, Ali N. Access and utilisation of primary health care services comparing urban and rural areas of Riyadh province, Kingdom of Saudi Arabia. *BMC Health Serv Res.* (2017) 17:1–13. doi: 10.1186/s12913-017-1983-z.
28. UN. United Nations: Transforming Our World: the 2030 Agenda for Sustainable Development. (2020).
29. Nakanishi N, Tataru K, Fujiwara H. Do preventive health services reduce eventual demand for medical care? *Soc Sci Med.* (1996) 43:999–1005. doi: 10.1016/0277-9536(96)00016-0.
30. WHO. Global Health Expenditure Database. (2018).

31. Qutub AF, Al-Jewair TS, Leake JL. A comparative study of the health care systems of Canada and Saudi Arabia: lessons and insights. *Int Dent J.* (2009) 59:277–83. 10.1922/IDJ_2215Qutub07.
32. Dryden R, Williams B, McCowan C, Themessl-Huber M. What do we know about who does and does not attend general health checks? Findings from a narrative scoping review. *BMC Public Health.* (2012) 12:1–23. 10.1186/1471-2458-12-723.
33. Shippee ND, Mullan RJ, Nabhan M, Kermott CA, Hagen PT, Rhodes DJ, et al. Adherence to preventive recommendations: experience of a cohort presenting for executive health care. *Popul Health Manag.* (2012) 15:65–70. 10.1089/pop.2011.0029.
34. Al-Hanawi MK, Chirwa GC, Pulok MH. Socio-economic inequalities in diabetes prevalence in the Kingdom of Saudi Arabia. *Int J Health Plann Manag.* (2020) 35:233–46. 10.1002/hpm.2899.
35. Shimoda A, Saito Y, Ooe C, Kondo N. Income-based inequality in nationwide general health checkup participation in Japan. *Public Health.* (2021) 195:112–7. 10.1016/j.puhe.2021.01.022.
36. Brunner-Ziegler S, Rieder A, Stein KV, Koppensteiner R, Hoffmann K, Dorner TE. Predictors of participation in preventive health examinations in Austria. *BMC Public Health.* (2013) 13:1–9. 10.1186/1471-2458-13-1138.
37. Tian W-H, Chen C-S, Liu T-C. The demand for preventive care services and its relationship with inpatient services. *Health Policy.* (2010) 94:164–74. 10.1016/j.healthpol.2009.09.012.
38. Haruyama Y, Yamazaki T, Endo M, Kato R, Nagao M, Umesawa M, et al. Personal status of general health checkups and medical expenditure: a large-scale community-based retrospective cohort study. *J Epidemiol.* (2017) 27:209–14. 10.1016/j.je.2016.06.001.
39. Chu C-L, Lawana N. Decomposition of income-related inequality in health check-ups services participation among elderly individuals across the 2008 financial crisis in Taiwan. *PLoS ONE.* (2021) 16:e0252942. 10.1371/journal.pone.0252942.
40. Al-Hanawi MK, Alsharqi O, Almazrou S, Vaidya K. Access to healthcare services in Saudi Arabia: a qualitative study of householders. *Appl Health Eco Health Policy.* (2018) 16:55–64. 10.1007/s40258-017-0353-7.
41. WHO. Health Check and Preventive Health Services: Worldwide Practices and Trends. (2017).
42. Hazazi A, Chandramohan S. Strengthening the Health Care System to Address the New Challenge of Non-Communicable Diseases in the Kingdom Of Saudi Arabia: A Systematic Review. *International Journal of Scientific Study.* 2017;5(7):114–20.
43. Vellakkal S, Subramanian S, Millett C, Basu S, Stuckler D, Ebrahim S. Socioeconomic inequalities in non-communicable diseases prevalence in India: disparities between self-reported diagnoses and standardized measures. *Plos one.* 2013;8(7):e68219.
44. Khademi N, Babanejad M, Asadmobini A, Karim H. The association of age and gender with risk factors of noncommunicable diseases among employees in West of Iran. *Int J Prev Med.* 2017;8:9.
45. Al-Hanawi MK, Chirwa GC, Pulok MH. Socio-economic inequalities in diabetes prevalence in the Kingdom of Saudi Arabia. *Int J Health Plan Manag.* 2020;35(1):233–46.
46. Al-Hanawi MK, Chirwa GC, Pemba LA, Qattan AM. Does prolonged television viewing affect Body Mass Index? A case of the Kingdom of Saudi Arabia. *Plos one.* 2020;15(1):e0228321.
47. Lai S, Shen C, Yang X, Zhang X, Xu Y, Li Q, et al. Socioeconomic inequalities in the prevalence of chronic diseases and preventive care among adults aged 45 and older in Shaanxi Province, China. *BMC Public Health.* 2019;19(1):1–12.
48. Sommer I, Griebler U, Mählknecht P, Thaler K, Bouskill K, Gartlehner G, et al. Socioeconomic inequalities in non-communicable diseases and their risk factors: an overview of systematic reviews. *BMC Public Health.* 2015;15(1):1–12.
49. Tyrovolas S, El Bcheraoui C, Alghnam SA, Alhabib KF, Almadi MAH, Al-Raddadi RM, et al. The burden of disease in Saudi Arabia 1990–2017: results from the Global Burden of Disease Study 2017. *The Lancet Planetary Health.* 2020;4(5):e195–208.
50. Al-Nozha MM, Abdullah M, Arafah MR, Khalil MZ, Khan NB, Al-Mazrou YY, et

- al. Hypertension in Saudi Arabia. *Saudi Med J.* 2007;28(1):77–84.
51. Bawazir A, Al-Surimi K, Suwaidan SD, AlShehri AM, AlFarhan AI, Abolfotouh MA. Capacity and readiness of primary health care centers for implementation of the basic strategy for prevention and control of non-communicable diseases in Saudi Arabia. A case study from the Ministry of National Guard-Health Affairs, Riyadh, Saudi Arabia. *Saudi Med J.* 2019;40(6):614–8.
52. Wagner K-H, Brath H. A global view on the development of non communicable diseases. *Preventive medicine.* 2012;54:38–41.
53. forest JJ, Sousa MV. Oil and terrorism in the New Gulf: framing US energy and security policies for the Gulf of Guinea. Lanham: Lexington Books; 2006.
54. Mahmood FM. Prevalence and prevention of lifestyle-related diseases in Saudi Arabia. *International journal of health sciences.* 2018;12(5):1.
55. Mandil AM, Alfurayh NA, Aljebreen MA, Aldukhi SA. Physical activity and major non-communicable diseases among physicians in Central Saudi Arabia. *Saudi Med J.* 2016;37(11):1243.
56. Biswas T, Islam MS, Linton N, Rawal LB. Socio-economic inequality of chronic non-communicable diseases in Bangladesh. *Plos one.* 2016;11(11):e0167140.
57. Hazazi A, Chandramohan S. Strengthening the Health Care System to Address the New Challenge of Non-Communicable Diseases in the Kingdom of Saudi Arabia: A Systematic Review. *International Journal of Scientific Study.* 2017;5(7):114–20.
58. Al-Hanawi MK, Chirwa GC, Pulok MH. Socio-economic inequalities in diabetes prevalence in the Kingdom of Saudi Arabia. *Int J Health Plan Manag.* 2020;35(1):233–46.
59. Khaliq AA. The Saudi health care system: a view from the minaret. *World Health Population.* 2012;13(3):52–64.
60. Herzallah HK, Antonisamy BR, Shafee MH, Al-Otaibi ST. Temporal trends in the incidence and demographics of cancers, communicable diseases, and non-communicable diseases in Saudi Arabia over the last decade. *Saudi Med J.* 2019;40(3):277.
61. Vaidya V, Partha G, Karmakar M. Gender differences in utilization of preventive care services in the United States. *J Womens Health.* 2012;21:140–5.
62. Rezaei S, Hajizadeh M, Irandoost SF, Salimi Y. Socioeconomic inequality in dental care utilization in Iran: a decomposition approach. *Int J Equity In Health.* 2019;18:1–11.
63. Klein J, Hofreuter-Gätgens K, von dem Knesebeck O. Socioeconomic status and the utilization of health services in Germany: a systematic review. *Health Care Utiliz Germany.* 2014:117–43.
64. Kjellsson G, Gerdtham U-G. On correcting the concentration index for binary variables. *J Health Eco.* 2013;32:659–70.
65. Wagstaff A, Watanabe N. What difference does the choice of SES make in health inequality measurement? *Health Eco.* 2003;12:885–90.
66. Koolman X, Van Doorslaer E. On the interpretation of a concentration index of inequality. *Health Eco.* 2004;13:649–56.
67. Janßen C, Sauter S, Kowalski C. The influence of social determinants on the use of prevention and health promotion services: results of a systematic literature review. *GMS Psycho Soc Med.* 2012;9:Doc07.
68. Si S, Moss JR, Sullivan TR, Newton SS, Stocks NP. Effectiveness of general practice-based health checks: a systematic review and meta-analysis. *Bri J Gen Pract.* 2014;64:e47–53.
69. Klein J, Hofreuter-Gätgens K, von dem Knesebeck O. Socioeconomic status and the utilization of health services in Germany: a systematic review. *Health Care Utiliz Germany.* 2014:117–43.
70. Van de Poel E, Van Doorslaer E, O'Donnell O. Measurement of inequity in health care with heterogeneous response of use to need. *J Health Eco.* 2012;31:676–89.
71. Erreygers G. Correcting the concentration index. *J Health Eco.* 2009;28:504–15.
72. Wesolowski A, O'Meara WP, Tatem AJ, Ndege S, Eagle N, Buckee CO. Quantifying the impact of accessibility on preventive healthcare in sub-Saharan Africa using mobile phone data. *Epidemiology.* 2015;26:223.