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DETERMINANTS OF HEALTH AND MORBIDITY IN CHITTORGARH DISTRICT: A MICRO-LEVEL STUDY ON PUBLIC HEALTH ACCESS AND AWARENESS

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ABSTRACT

This study investigates the determinants of health and morbidity in Chittorgarh district, Rajasthan, focusing on micro-level access to healthcare and awareness among the local population. Using a mixed-method approach with primary survey data from selected villages, the study evaluates the correlation between demographic, socio-economic, and environmental variables with morbidity patterns. Findings suggest that health outcomes are deeply influenced by awareness levels, income, education, sanitation, and availability of public health services. Policy recommendations stress localized health interventions, community awareness programs, and infrastructure upgrades.

Keywords: Health, Village, Micro, Healthcare, Poverty.

I. INTRODUCTION

Health is a fundamental human right and a crucial determinant of human development. Access to good health care and awareness about health practices significantly influence the quality of life, productivity, and longevity of individuals, especially in developing countries like India. While urban areas in India are increasingly witnessing improvements in healthcare access due to rapid infrastructural development and digital healthcare integration, rural and semi-urban regions often remain marginalized. Among these, the Chittorgarh district of Rajasthan presents a compelling case for micro-level investigation into the determinants of health and morbidity, particularly given its mixed socio-economic characteristics, tribal populations, and limited healthcare infrastructure.

Chittorgarh, located in the southeastern part of Rajasthan, is known historically for its rich cultural heritage and strategically significant fort, but it remains socio-economically underdeveloped in many respects. The district has a population of over 1.5 million, with a large proportion residing in rural and tribal areas. These communities typically face challenges such as poverty, low literacy, malnutrition, poor sanitation, and limited healthcare infrastructure. These socio-economic and environmental variables directly influence health outcomes and contribute to the disease burden in the region. Although several national and state-level schemes have been introduced to address healthcare inequality, the district continues to struggle with poor maternal health indicators, high infant mortality rates, increasing non-communicable diseases, and frequent outbreaks of communicable diseases like malaria and diarrhea.

The concept of health itself is multi-dimensional, encompassing physical, mental, and social well-being. The World Health Organization defines health as not merely the absence of disease but a state of complete physical, mental, and social well-being. Therefore, to study the determinants of health and morbidity in a rural context like Chittorgarh, one must consider a broad range of factors—economic status, education levels, environmental conditions, gender roles, cultural practices, and political will. Health awareness and access to healthcare services are two pillars that directly influence how communities manage illness, seek treatment, and adopt preventive health behaviors. In areas like Chittorgarh, these pillars are often compromised due to systemic neglect, lack of infrastructure, and deep-rooted socio-cultural barriers.

Healthcare access in Chittorgarh is limited not just in terms of infrastructure but also in terms of

quality and utilization. Despite the presence of Primary Health Centres (PHCs), Sub-Centres, and Community Health Centres (CHCs), many of these facilities suffer from shortages of trained personnel, essential medicines, diagnostic tools, and reliable transportation services. Often, the burden of primary healthcare is carried by Accredited Social Health Activists (ASHAs), who play a vital role in bridging the gap between formal healthcare systems and rural populations. However, even their efforts are constrained by low compensation, lack of proper training, and overwhelming workloads. Moreover, geographic distance and lack of transportation infrastructure further isolate many villages, making even basic health services hard to reach.

Health awareness in Chittorgarh is another critical issue. The population's knowledge about hygiene, nutrition, reproductive health, child immunization, and disease prevention is often low, especially among women and marginalized communities. In many cases, traditional beliefs and mistrust of modern medicine delay timely medical intervention. This lack of awareness is exacerbated by limited exposure to educational media and formal health education programs. Gender disparity is also a significant determinant, as women in many households are neither decision-makers nor do they possess the autonomy to seek medical care without male approval. This leads to delayed treatments, poor maternal and child health outcomes, and the persistence of preventable diseases.

Environmental determinants also play a pivotal role in health outcomes. In Chittorgarh, a significant portion of the population still lacks access to clean drinking water and proper sanitation facilities. Open defecation remains prevalent in certain areas despite efforts under the Swachh Bharat Mission. Contaminated water sources are directly linked to high incidences of waterborne diseases such as cholera, diarrhea, and typhoid. Moreover, the increasing effects of climate variability, including irregular rainfall and rising temperatures, are contributing to the spread of vector-borne diseases such as malaria and dengue, especially in the monsoon season.

The burden of non-communicable diseases (NCDs) is also rising in Chittorgarh, reflecting a broader national trend. Diseases like hypertension, diabetes, and cardiovascular conditions are emerging as major health threats, particularly in the working-age population. These conditions are often undiagnosed or diagnosed late due to poor screening services and low awareness. Lifestyle changes, unbalanced diets, lack of physical activity, and tobacco use further complicate the

situation. In the absence of early interventions, these NCDs lead to long-term morbidity, reduced economic productivity, and increased healthcare costs for families already living on the economic margins.

Addressing these complex issues requires a nuanced, localized understanding of the social determinants of health. National and state-level policies often fail to reflect the ground realities of districts like Chittorgarh. A micro-level study, therefore, becomes essential to explore specific variables such as the role of caste, gender, distance from health facilities, income levels, education, and awareness in shaping health outcomes. By focusing on a grassroots-level analysis, this research intends to fill the gap between policy formulation and on-ground implementation. Such an approach allows for identifying bottlenecks in service delivery, highlighting successful community practices, and proposing targeted interventions that can yield real improvements.

The primary motivation behind this study stems from the need to provide empirical data and insights that can aid local governance bodies, healthcare practitioners, and policymakers in designing more responsive and inclusive healthcare programs. By employing both quantitative and qualitative research methods—including household surveys, interviews with healthcare workers, and GIS mapping—this study aims to deliver a comprehensive overview of health access and awareness in Chittorgarh. It also seeks to examine the efficacy of ongoing schemes like the National Health Mission (NHM), Janani Suraksha Yojana (JSY), and Ayushman Bharat in the district context, identifying gaps in coverage and effectiveness.

II. SOCIO-ECONOMIC DETERMINANTS

The health and morbidity profile of any region is deeply rooted in its socio-economic structure, and Chittorgarh district is no exception. Situated in the semi-arid zone of Rajasthan, Chittorgarh presents a complex socio-economic landscape where health outcomes are not only influenced by medical infrastructure but also by the interplay of poverty, education, caste, occupation, gender, housing conditions, and social norms. These determinants collectively shape the level of access to healthcare services, the ability to adopt healthy behaviors, and the capacity to respond to illnesses. Understanding these socio-economic factors is crucial for designing targeted interventions that are context-sensitive and community-driven.

Poverty is one of the most dominant socio-economic determinants in Chittorgarh. A significant proportion of the district's population lives below the poverty line, with many households dependent on subsistence agriculture, daily wage labor, or seasonal employment in nearby urban centers. These income-generating activities are often irregular, poorly paid, and vulnerable to climatic and economic shocks. Due to limited financial resources, poor households are unable to afford private healthcare services and often postpone seeking medical help until illnesses become severe. Even when public health services are free, indirect costs such as transportation, loss of daily wages, and medicine unavailability force families to avoid or delay treatment. Poverty also affects nutritional intake, particularly among children and pregnant women, leading to chronic malnutrition, anemia, stunting, and increased susceptibility to infections.

Closely tied to poverty is the level of education, another powerful determinant of health behavior and health outcomes. In Chittorgarh, literacy rates are below the national average, and there is a pronounced gap between male and female literacy. Educated individuals are more likely to understand the importance of preventive healthcare, hygiene, immunization, and balanced diets. They are also more capable of navigating the healthcare system, reading prescriptions, understanding dosage instructions, and recognizing symptoms that require urgent medical attention. In contrast, low literacy often leads to reliance on informal or unqualified practitioners, self-medication, and traditional healers, which may delay proper diagnosis and treatment. Moreover, awareness about government health schemes such as Ayushman Bharat, Janani Suraksha Yojana, or child immunization programs is significantly lower among illiterate populations, especially women, resulting in poor utilization of essential services.

Caste and social stratification further complicate the health landscape in Chittorgarh. The district is home to several Scheduled Castes (SC), Scheduled Tribes (ST), and Other Backward Classes (OBC), many of whom live in geographically isolated hamlets or tribal villages with minimal infrastructure. Historically marginalized, these communities often face systemic discrimination and neglect, which translates into poorer health indicators. Access to health services among SC/ST populations is constrained not only by economic barriers but also by social stigma and caste-based discrimination, even within public institutions. Reports of being denied respectful treatment or delayed service discourage many from visiting healthcare facilities altogether. Social exclusion also affects the distribution of health-related information, with lower-caste communities frequently

missing out on health awareness campaigns and government outreach.

Occupational patterns in the district also contribute to varying levels of health risk and morbidity. A large portion of the population is engaged in agriculture, stone mining, and daily wage labor—occupations characterized by high physical strain, poor occupational safety, and exposure to environmental hazards. In particular, workers in stone quarries are prone to respiratory ailments such as silicosis, a serious occupational lung disease caused by inhaling silica dust. Many workers continue laboring without protective equipment or medical check-ups, due to a lack of employer accountability and poor enforcement of labor laws. Seasonal migration in search of work further affects the continuity of healthcare, particularly for women and children, as migrant families often lose contact with local ASHA workers and anganwadi centers.

Housing conditions and environmental exposure are also deeply linked to socio-economic status. In Chittorgarh, many low-income households live in kachcha (non-permanent) structures with poor ventilation, inadequate insulation, and limited access to safe drinking water and sanitation. These housing environments create ideal conditions for the spread of communicable diseases such as tuberculosis, diarrhea, typhoid, and vector-borne illnesses like malaria and dengue. The scarcity of potable water often forces families to rely on open wells or hand pumps located far from their homes. Women and children typically bear the burden of water collection, which not only exposes them to physical strain but also limits the time available for education, childcare, or income-generating activities. Furthermore, limited access to clean fuel and proper cooking facilities leads to indoor air pollution, which disproportionately affects women's respiratory health.

Gender, as a cross-cutting socio-economic determinant, plays a crucial role in determining access to and quality of healthcare in the district. Deeply entrenched patriarchal norms limit women's autonomy in making health-related decisions. Women often require permission from male family members to visit healthcare centers and are discouraged from discussing reproductive or sexual health issues. This results in delayed antenatal care, underutilization of family planning services, and a general lack of awareness regarding maternal health rights. Female literacy and employment levels are also significantly lower, reducing women's access to health information and their ability to afford treatment. Moreover, the shortage of female health workers in rural health centers further deters women from seeking timely and appropriate medical advice, especially for gynecological

or maternal concerns.

Children and the elderly represent vulnerable demographic groups within the socio-economic fabric of Chittorgarh. Children from low-income and low-literacy households are at greater risk of being under-immunized, undernourished, and developmentally delayed. Their access to health services is largely dependent on the health-seeking behavior of their parents, especially mothers. On the other hand, elderly individuals, particularly widows and those without caregivers, often suffer from multiple chronic conditions without regular medical supervision. In many households, the elderly are not prioritized in health spending due to limited resources and younger family members taking precedence. Lack of geriatric care, pensions, and community support systems further marginalize this group, compounding their health risks.

Social capital and community cohesion also influence health outcomes. In tightly knit communities where local leadership, women's self-help groups, or village health committees are active, health awareness and service uptake tend to be better. However, in fragmented communities or those with weak governance, public health campaigns may fail to reach marginalized households. Political representation and advocacy also play a role; villages with active panchayats and vocal local leaders are more likely to demand better health services and infrastructural support. Conversely, politically neglected villages may remain underserved despite evident health needs.

III. ENVIRONMENTAL FACTORS

Environmental conditions are among the most critical yet often underestimated determinants of health and morbidity, especially in rural and semi-urban areas like Chittorgarh district in Rajasthan. In a region characterized by arid climatic conditions, erratic rainfall, limited water resources, poor sanitation, and unplanned habitation, the interplay between environment and health becomes particularly complex and pronounced. The daily exposure to degraded natural resources, unsafe living conditions, and climate vulnerabilities severely affects the health outcomes of the local population. In Chittorgarh, environmental factors not only act as direct causes of disease but also significantly contribute to the spread, persistence, and recurrence of both communicable and non-communicable illnesses, making them central to any comprehensive assessment of public health and morbidity patterns in the district.

Water scarcity and water quality are among the most pressing environmental health concerns in Chittorgarh. Due to the region's semi-arid geography, reliable access to clean and potable water is limited. Groundwater remains the primary source of drinking water for the majority of the rural population, but groundwater tables have been rapidly depleting due to overuse in agriculture and industrial activities, including textile and cement production. Moreover, the water that is available is often contaminated with high levels of fluoride, nitrate, and other pollutants. Numerous villages in the district report cases of fluorosis, a chronic condition caused by excessive fluoride intake that affects bones and teeth. Children and the elderly are particularly vulnerable to this condition, which can cause lifelong deformities and disability. In some areas, water contamination is also linked to industrial effluents being discharged untreated into natural water bodies, posing long-term ecological and health hazards. Diarrhea, cholera, typhoid, and hepatitis A are among the most common waterborne diseases frequently reported during the monsoon and post-monsoon seasons.

Sanitation is another major environmental challenge contributing to health issues in Chittorgarh. Despite the national push for improved sanitation under the Swachh Bharat Abhiyan, a significant portion of the rural population in the district still practices open defecation. Many households either lack toilets or possess unusable or poorly maintained latrines. This leads to environmental contamination, especially of water sources, and increases the risk of fecal-oral transmission of diseases. Children are the most affected demographic, with frequent episodes of diarrhea, parasitic infections, and associated malnutrition. Inadequate waste disposal practices, including the dumping of solid waste in open areas and the absence of systematic drainage systems, further exacerbate the issue. During monsoons, stagnant water becomes a breeding ground for disease-carrying vectors such as mosquitoes, contributing to seasonal outbreaks of malaria, dengue, and chikungunya.

Air quality, both indoor and outdoor, is another critical environmental determinant affecting morbidity in Chittorgarh. While urban industrial pollution plays a role in deteriorating ambient air quality in towns like Nimbahera and Chittorgarh city, indoor air pollution remains a silent killer in rural households. A vast majority of families in villages still rely on biomass fuels—such as wood, cow dung, and crop residues—for cooking and heating. The use of traditional chulhas (mud stoves) in poorly ventilated kitchens results in prolonged exposure to smoke, carbon monoxide, and particulate matter. Women and children, who spend the most time indoors, are at elevated risk

of respiratory infections, chronic bronchitis, chronic obstructive pulmonary disease (COPD), and even cardiovascular complications. Despite schemes like the Pradhan Mantri Ujjwala Yojana (PMUY) aimed at promoting clean LPG cooking fuels, affordability, accessibility, and behavioral inertia remain barriers to full adoption.

Housing and settlement patterns also significantly influence health outcomes. In Chittorgarh's rural and tribal belts, many people live in overcrowded, poorly constructed homes with limited natural light, cross-ventilation, and basic infrastructure. These substandard living conditions increase susceptibility to infections, skin diseases, and vector-borne illnesses. Overcrowding exacerbates the spread of communicable diseases like tuberculosis, while damp, dark interiors contribute to fungal infections and musculoskeletal issues. Furthermore, the absence of secure roofing and flood protection makes households vulnerable to environmental shocks such as heavy rains, flooding, or extreme temperatures, all of which have direct and indirect health consequences. Seasonal migration in search of livelihood often forces families to live in temporary shelters with almost no protection from environmental hazards, further compounding their exposure to disease.

Climate variability and extreme weather events have become increasingly significant environmental determinants in recent years. Chittorgarh experiences extreme summer temperatures often exceeding 45°C, contributing to cases of heat stroke, dehydration, and other heat-related illnesses. Conversely, winters bring their own set of health challenges, including respiratory ailments and viral infections. Climate change has also altered rainfall patterns, leading to irregular monsoons, flash floods, or prolonged dry spells, each of which disrupts local agriculture and water supply systems. These climate shifts indirectly contribute to food insecurity and malnutrition, which have long-term effects on health, particularly among children, pregnant women, and the elderly. Vector ecology has also changed, with mosquitos now breeding in areas previously considered safe, expanding the seasonal and geographic spread of diseases like dengue and chikungunya.

Environmental degradation through deforestation, mining, and overuse of natural resources further impacts health. Large-scale mining activities in the region, especially limestone and stone quarrying, contribute to environmental pollution, loss of green cover, and displacement of local communities. Dust from mining operations is a significant source of respiratory problems among

workers and nearby residents. The noise pollution and vibrations from heavy machinery also affect mental well-being, disturb sleep cycles, and contribute to stress-related health conditions. In many mining zones, groundwater contamination and disruption of natural aquifers are reported, reducing both the quality and availability of drinking water. The ecological imbalance resulting from such unsustainable practices diminishes the natural resilience of the area to handle disease outbreaks, droughts, and heatwaves.

Waste management, or rather the lack of it, is another environmental concern linked to health in Chittorgarh. With limited municipal capabilities in smaller towns and rural areas, solid waste often piles up in open fields, near water sources, or around residential areas. Decomposing waste attracts flies, rodents, and stray animals, all of which serve as disease vectors. Medical waste from local clinics and dispensaries is also poorly managed in many cases, posing a serious biohazard. Plastic waste blocking drainage systems further increases the risk of waterlogging and mosquito breeding, particularly during the monsoon season. The absence of systematic awareness about waste segregation and recycling practices means that environmental hygiene remains low across communities.

In addition, the limited ecological awareness among the population results in unsustainable behaviors that harm both the environment and health. Practices such as open burning of agricultural waste, excessive pesticide use, deforestation for fuelwood, and overgrazing by livestock contribute to environmental degradation. Pesticide exposure among farmers and agricultural laborers is linked to a range of health issues, including skin disorders, neurological symptoms, and in severe cases, poisoning. The improper storage and handling of these chemicals—often done without protective gear or adequate training—reflect both a lack of regulation and a lack of awareness about their health implications.

IV. HEALTH INFRASTRUCTURE AND ACCESS

The availability, quality, and accessibility of health infrastructure form the backbone of any effective public health system, and in the context of Chittorgarh district, these elements remain deeply inadequate and unevenly distributed. As one of the historically underdeveloped districts in southern Rajasthan, Chittorgarh continues to grapple with significant deficiencies in healthcare delivery mechanisms. Despite efforts at decentralization and the expansion of public health

services under national programs such as the National Health Mission (NHM), the actual health infrastructure in the district struggles to meet the growing and diversifying healthcare demands of a largely rural, socio-economically vulnerable population. The challenges in Chittorgarh are multi-layered, including poor physical infrastructure, human resource shortages, lack of specialized services, uneven facility distribution, weak referral systems, and logistical barriers, all of which severely limit health access, especially for marginalized and remote communities.

The district's public health system is organized into a three-tiered structure comprising Sub-Centres (SCs), Primary Health Centres (PHCs), and Community Health Centres (CHCs), with district hospitals and a few private facilities operating in urban centers. While, on paper, this structure appears comprehensive, the functional reality reveals glaring inefficiencies. Many sub-centres in remote villages operate without regular electricity, running water, or essential medical supplies. PHCs often face chronic understaffing, and several are manned by only one doctor or auxiliary nurse midwife (ANM), who is often overburdened with immunization drives, maternal health responsibilities, and paperwork. CHCs, meant to serve as referral hubs offering specialized care, often lack specialists like pediatricians, gynecologists, or surgeons. This results in frequent referral of even minor cases to the district hospital, causing delays in treatment and unnecessary patient mobility.

One of the most significant barriers to health access in Chittorgarh is geographic inaccessibility. Many villages are located far from the nearest PHC or CHC, often separated by poor road conditions, especially in monsoon months. Public transportation is unreliable or altogether absent in interior regions, forcing residents to depend on private vehicles, which are expensive and unaffordable for low-income households. Pregnant women in labor, children with high fever, or patients with acute conditions often arrive late to health facilities, if at all. For tribal and marginalized communities living in forested or hilly areas, the journey to a healthcare facility can involve hours of walking or multiple modes of transport. This logistical burden discourages early care-seeking behavior, contributing to higher morbidity and mortality.

Another pressing issue is the acute shortage of trained medical professionals. According to official reports and field observations, the doctor-to-population ratio in Chittorgarh is far below the national average. Vacancies for government-appointed medical officers and specialists often

remain unfilled for years, particularly in rural PHCs and CHCs where living conditions and professional support are inadequate. Paramedical staff, including lab technicians, pharmacists, and ANMs, also face similar shortages. As a result, critical services like lab testing, antenatal care, deliveries, and emergency care are frequently unavailable or delayed. Even when present, overworked staff struggle to maintain service quality. In this vacuum, informal or unqualified practitioners—commonly referred to as "jhola chaap doctors"—fill the gap, providing unregulated care that often leads to misdiagnosis, inappropriate medication, and health complications.

The lack of gender-sensitive infrastructure further limits access, particularly for women and adolescent girls. Many PHCs and CHCs in Chittorgarh lack separate waiting areas, clean toilets, or female doctors, all of which are critical for encouraging women to seek timely healthcare. Cultural taboos and social norms often prevent women from discussing reproductive or gynecological issues with male doctors, leading to untreated or poorly managed conditions such as anemia, menstrual disorders, or reproductive tract infections. In the absence of nearby functional facilities, many women resort to home deliveries conducted by untrained birth attendants, increasing the risk of maternal and neonatal complications. This is despite the availability of schemes like Janani Suraksha Yojana (JSY), which incentivize institutional deliveries. Implementation gaps, lack of awareness, and infrastructural limitations all conspire to reduce the scheme's reach and impact.

Another layer of complexity is added by poor infrastructure for emergency services. While 108 ambulance services are operational in the district, response times are highly variable, and coverage is limited in remote areas. Poor road conditions, communication barriers, and delays in dispatching vehicles frequently result in patients reaching hospitals too late. Many villages lack helplines or digital connectivity, further isolating them from timely health interventions. Emergency obstetric care, snakebite treatment, and trauma management—all essential services in a rural district—are either inaccessible or unreliable. This lack of emergency preparedness places an enormous burden on families during health crises and undermines public trust in the formal health system.

Access to diagnostics and medicines is also limited. Many PHCs and SCs do not have the equipment or reagents needed to conduct even basic blood or urine tests. Essential drug supplies are frequently disrupted, with stock-outs reported for antibiotics, antipyretics, antihypertensives,

and even iron and folic acid tablets. This leads to either delayed treatment or increased out-of-pocket expenditure at private pharmacies. Supply chain inefficiencies, inadequate monitoring, and poor storage facilities exacerbate the problem. Even where medicines are available, irrational prescribing practices and lack of patient education about dosage and side effects compromise treatment outcomes.

Public-private collaboration in healthcare remains underdeveloped in Chittorgarh. While some NGOs and charitable institutions operate clinics or mobile health units, these are limited in scale and coverage. Private hospitals and diagnostic centers are largely confined to urban areas like Chittorgarh city or Nimbahera, making them inaccessible to the rural majority. Moreover, the high cost of private care deters most economically vulnerable households from seeking timely interventions, even in emergencies. Health insurance penetration is low despite the introduction of Ayushman Bharat – Pradhan Mantri Jan Arogya Yojana (PM-JAY), due to issues of documentation, poor awareness, and denial of services by empanelled hospitals citing administrative loopholes.

Health information systems and record-keeping are also weak, affecting both monitoring and planning. Many health workers maintain paper-based records, which are often incomplete or inconsistently updated. This affects the accuracy of disease surveillance, maternal and child health tracking, and immunization coverage assessments. Poor data quality hampers evidence-based policy-making, funding allocation, and resource planning. Digitization efforts, though underway in some areas, are hindered by lack of training, electricity shortages, and limited access to digital infrastructure.

Despite these challenges, community-based health workers such as Accredited Social Health Activists (ASHAs), Anganwadi Workers (AWWs), and Auxiliary Nurse Midwives (ANMs) continue to play a critical role in bridging the gap between health facilities and the population. These frontline workers are instrumental in mobilizing communities, conducting awareness drives, facilitating immunizations, and providing maternal and child health services. However, they are frequently overburdened, underpaid, and inadequately trained for the increasingly complex healthcare tasks they are expected to perform. Without systemic support, training, and compensation, their potential to improve health access remains underutilized.

V. CONCLUSION

The health and morbidity situation in Chittorgarh district is shaped by a mix of socio-economic challenges, environmental issues, limited health infrastructure, and low public awareness. Many people in the district still struggle with access to basic healthcare due to poverty, lack of education, poor sanitation, and distant or under-equipped health centers. Women, children, and marginalized communities are the most affected. Even though government programs and health schemes are in place, their impact remains limited because of poor implementation and low awareness. To improve the overall health condition of the district, it is important to focus on better infrastructure, increased awareness, trained health workers, and community participation. A people-centered and locally focused approach is essential to bring lasting improvements in public health.

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