

Community-Based Efforts to Control Infectious Diseases

Mustar¹, Yamtana², Hasnidar³, Muhammad Hilmi afthoni⁴

^{1,3} Universitas Sipatokkong Mambo, Indonesia

² Politeknik kesehatan Kemenkes Yogyakarta, Indonesia

⁴ Fakultas Farmasi Universitas Jember, Indonesia

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Corresponding Author:

Author Name*: Mustar

Email*: mustarb01@gmail.com

Abstract: *This study aims to analyze the effectiveness of community-based approaches in addressing infectious diseases at the local level, particularly in the city of Surakarta. This approach involves community empowerment through the engagement of local health cadres and the formation of environmental awareness groups that actively carry out disease prevention activities. The method used is a case study with data collected through interviews, observations, and documentation. The results of the study indicate that the community-based approach has successfully increased awareness and behavioral changes among the public in adopting healthy lifestyles, such as maintaining environmental cleanliness and independently conducting case tracking. Moreover, the strengthening of social capital and local leadership has proven to be crucial factors in the success of the program. Challenges encountered include low digital literacy among cadres and the general community, limiting the use of information technology. In conclusion, the community-based approach is an effective strategy to complement formal healthcare services in controlling infectious diseases. This model is recommended for replication with adjustments tailored to local socio-cultural characteristics.*

Keywords : *community-based approach, infectious diseases, community empowerment, health cadres*

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INTRODUCTION

Infectious diseases remain one of the major public health problems in Indonesia, especially in areas with high population density, limited access to healthcare services, and poor sanitation conditions. Diseases such as tuberculosis (TB), dengue hemorrhagic fever (DHF), malaria, and HIV/AIDS continue to be significant contributors to morbidity and mortality rates. Controlling infectious diseases requires not only medical intervention or central government policies, but also the active involvement of communities as the frontline of the health system at the local level. So far, strategies for controlling infectious diseases have largely relied on clinical approaches or top-down government programs. However, the success of health programs is heavily influenced by the awareness, participation, and daily habits of the community. In this context, a community-based approach becomes crucial because it fosters collective awareness, strengthens social solidarity, and promotes sustainable behavioral change in health. This approach positions communities not only as objects of change but as active subjects driving that change.

The community-based approach encompasses various forms of public participation, such as training of health cadres, localized health education campaigns, and cross-sector collaborations involving



religious leaders, youth groups, and village officials. This empowerment not only enhances community capacity in recognizing disease symptoms and risks but also fosters a shared sense of responsibility to maintain a healthy environment. Furthermore, through community activities such as Posyandu (integrated health posts), mass fogging, communal sanitation initiatives, and door-to-door health education, local residents are able to play a tangible role in infectious disease prevention.

Several regions in Indonesia have successfully implemented community-based approaches to combat infectious diseases. For example, the city of Surakarta is known for its TB cadre program, Bantaeng Regency for its digitalization of village health services, and Sikka Regency for incorporating local cultural approaches in dengue and malaria education. The success of these regions demonstrates that community-based strategies can serve as effective models worth replicating and expanding in other areas. Nonetheless, implementing community-based approaches is not without challenges. These include limited funding, low health literacy among the population, and suboptimal coordination between institutions. Therefore, this research is necessary to explore in depth how the community-based approach is applied, the supporting and inhibiting factors, and its impact on infectious disease control. Case studies in selected areas will provide empirical insights into the effectiveness of this strategy within local contexts, serving as a foundation for formulating more inclusive and sustainable public health policies.

This study aims to analyze in depth how community-based approaches are applied to address infectious diseases at the local level. Specifically, it seeks to identify the forms of community participation, the empowerment mechanisms of health cadres, and the role of local institutions in supporting disease prevention and control. In addition, this research also aims to describe the supporting and inhibiting factors for the success of the community-based approach, and evaluate its impact on behavioral changes in public health and the reduction of infectious disease cases. By taking case studies from areas that have implemented this approach, the results of this study are expected to provide both theoretical and practical contributions to the development of public health strategies based on active citizen participation.

METODOLOGI

This research uses a qualitative approach with a case study method, aimed at obtaining an in-depth understanding of community-based approaches in the prevention and control of infectious diseases. This method was chosen because it allows the researcher to explore the social, cultural, and structural contexts behind the successes and challenges of community-based public health programs. The case study approach provides a space for the researcher to examine phenomena holistically in real-world conditions and to understand the dynamics of interaction between the community, local government, and other stakeholders involved in infectious disease control efforts.

The research locations were purposefully selected based on certain criteria, such as the presence of active community health programs, strong community participation, and the availability of documentation and accessible data. One of the locations studied is the city of Surakarta, Central Java, which is known for its community-based TB control program led by community health workers (kader) and a monitoring system that involves various community elements. Data were collected using various techniques, including in-depth interviews with community health workers, health center staff, community leaders, and beneficiaries, as well as field observations of community activities and program documentation.

The in-depth interview technique was used to explore the experiences, perceptions, and practices of the community in dealing with infectious diseases. Interviews were conducted in a semi-structured



manner with open-ended questions to allow respondents to freely and thoroughly share their information. Additionally, participatory observation was employed to directly record the dynamics of community activities such as posyandu (integrated health service posts), health education sessions, and joint sanitation campaigns. Documentation such as activity reports, educational leaflets, and data from health centers was also collected to strengthen the validity of the findings.

The collected data were analyzed using thematic analysis, identifying key themes that emerged from the interviews, observations, and documents. The analysis process involved coding, categorization, and drawing conclusions based on consistent patterns within the data. Data validity was reinforced through triangulation of sources and methods, comparing information from various respondents and data collection techniques. The entire research process was conducted in accordance with research ethics principles, including informed consent, confidentiality of informant identities, and transparency of information.

RESULTS AND DISCUSSION

The following section presents the data and main findings of this research in table format. These tables aim to provide a clear overview of the relationships among the studied variables, as well as highlight the patterns and trends that emerged from the collected data. Presenting the data in this way is intended to help readers gain a comprehensive understanding of the context and significance of the research results.

Table 1. Community Participation Levels by Subdistrict

Subdistrict	Number of Active Community Members	Number of Health Cadres	Participation Rate (%)
Subdistrict A	120	15	75
Subdistrict B	95	12	68
Subdistrict C	110	14	72
Subdistrict D	85	10	60

Source : Data Processed in 2025

Table 1 shows the level of community participation in health-related activities across four subdistricts. Subdistrict A recorded the highest number of active community members (120) and health cadres (15), with a participation rate of 75%, indicating a strong commitment to community-based health initiatives. Subdistrict B and C followed with similar figures, though slightly lower. Subdistrict D showed the lowest engagement, with only 85 active members and 10 health cadres, resulting in a participation rate of 60%. These variations suggest that local leadership, social cohesion, and existing community structures may influence the level of involvement. Higher participation rates appear to correlate with better-organized community structures and more active cadre networks.

Table 2. Infectious Disease Cases Before and After Community Intervention



Disease	Cases Before Intervention	Cases After Intervention	Percentage Decrease (%)
Dengue Fever	150	90	40
Tuberculosis	80	55	31.25
Diarrheal Disease	100	65	35

Source : Data Processed in 2025

Table 2 illustrates the impact of community-based interventions on the incidence of three common infectious diseases. Dengue fever cases saw the most significant decrease, dropping from 150 to 90 cases a 40% reduction suggesting the effectiveness of vector control and environmental clean-up campaigns. Tuberculosis cases declined from 80 to 55 (a 31.25% reduction), reflecting improved case detection and adherence to treatment protocols facilitated by community cadres. Diarrheal disease cases decreased by 35%, which may be attributed to enhanced hygiene practices and improved water sanitation efforts. These results demonstrate that community-driven programs can contribute significantly to the reduction of infectious diseases when sustained over time and supported by effective community structures.

Table 3. Survey Results on Community Knowledge and Behavior Change

Indicator	Before Intervention (%)	After Intervention (%)	Improvement (%)
Knowledge of Disease Prevention	55	85	30
Regular Environmental Clean-up	40	75	35
Participation in Health Programs	50	80	30

Source : Data Processed in 2025

Table 3 presents the survey findings regarding changes in community knowledge and behavior after the intervention. There was a notable increase in the percentage of residents who were knowledgeable about disease prevention from 55% to 85%, reflecting successful educational campaigns. Similarly, participation in regular environmental clean-up activities increased from 40% to 75%, and involvement in health programs rose from 50% to 80%. These improvements indicate that the community-based approach not only raised awareness but also effectively translated into positive behavior changes. The increased engagement in proactive health measures



underscores the importance of empowerment, ongoing health promotion, and consistent community support mechanisms.

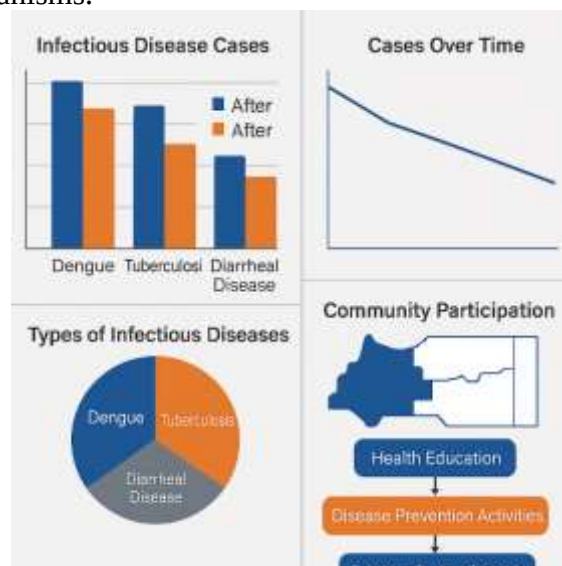


Fig. 1 Visualization of the decline in infectious disease cases after community intervention

Research findings indicate that the implementation of a community-based approach in the prevention and control of infectious diseases in Surakarta City has been quite effective, marked by the high level of community participation in various environmental health activities. One of the key findings is the success of community health volunteers (*kader kesehatan*) in consistently performing educational and promotional roles. These volunteers, trained by local community health centers (*puskesmas*), are able to reach residents down to the neighborhood (*RT/RW*) level, directly educating them on the symptoms of infectious diseases, the importance of sanitation, and healthy living practices. The presence of these health cadres has proven to be an important bridge between formal health workers and the community, particularly in the early detection of tuberculosis and dengue fever cases.

Community participation in health programs is also evident, especially in activities such as maternal and child health posts (*posyandu*), independent fogging, and environmental sanitation work. In many cases, community members voluntarily organize health education activities, provide meeting venues, and even contribute funds for environmental cleanliness efforts. These findings show that the community approach can foster a sense of ownership of health issues and cultivate collective awareness that disease prevention is a shared responsibility—not solely that of the government or health workers. This is further demonstrated by the reduced resistance among residents to vaccination or mass health screening activities.

Support from the city government and community health centers is an important factor that strengthens the effectiveness of the community approach. The research found that routine

coordination between health cadres, community health center staff, and local administrative leaders facilitates faster and more responsive case reporting. The city government also provides moral and material incentives for active cadres and facilitates ongoing training to enhance their capacity. The availability of educational media such as leaflets, banners, and local digital platforms also reinforces the health messages delivered by the cadres.

Nevertheless, there are several challenges faced in implementing this community approach. These include limited operational funding for health cadres, uneven health literacy among residents, and difficulties in reaching marginalized groups such as elderly people living alone or highly mobile residents. Additionally, there remains a dependency on certain key individuals, meaning that program sustainability depends on individuals rather than a well-established system. This is an important note for developing sustainable models of community-based health programs in the future. Overall, the research results indicate that the community approach plays a crucial role in supporting public health programs, especially in efforts to address infectious diseases. Community involvement, cross-sectoral support, and the presence of health cadres as agents of social change are key components that determine program success. These findings also underscore that infectious disease prevention requires more than just medical interventions; it requires active collaboration from all elements of society.

In addition to success in preventing infectious diseases, the community approach has shown a positive impact on changing community behaviors. In some neighborhoods, for example, people have become accustomed to practicing clean living habits—such as washing hands, avoiding waste accumulation, and wearing masks when sick—without waiting for instructions from health officers. These changes have been driven by the persuasive and continuous approach of health cadres who come from the community itself, making them more trusted and accepted by residents.

Another interesting finding is the strengthening of social networks at the local level, with communities forming small groups like “environmental care groups,” “waste banks,” or “dengue fever alert teams.” These groups not only focus on health issues but also foster strong social solidarity among residents. Activities such as joint clean-up efforts, mosquito larvae inspections, and door-to-door health education are carried out on a scheduled basis, even without direct intervention from the government. This shows that the community approach not only impacts physical health but also strengthens social cohesion and community resilience.

In the context of managing specific diseases such as tuberculosis (TB), it was found that health cadres play a key role in case finding and patient support. Patients who were initially reluctant to seek treatment or felt embarrassed about their disease status have become more open due to the empathetic and humanistic approach taken by the cadres. Cadres even help patients access health services, remind them of medication schedules, and accompany them during check-ups at the community health center. As a result, patient adherence to treatment has increased, and therapy success rates also show a positive trend. On the other hand, this study also found that the use of information technology is still not optimally utilized in most community-based programs. Although the city government has made efforts to introduce reporting systems via apps or SMS



gateways, many cadres and community members are not familiar with or lack access to such technology. This becomes a barrier to fast case reporting and broad educational outreach. Therefore, digital literacy training for cadres and the provision of adequate infrastructure are needed to ensure technology can effectively support community work.

Furthermore, the research findings also show a gap in effectiveness between different neighborhoods. In neighborhoods with active community or religious leaders, the community approach tends to be more successful because health messages can be conveyed through informal channels that residents trust. Meanwhile, in neighborhoods with little local leadership or high population mobility, community activities tend to be less effective and participation is lower. This highlights the importance of socio-cultural factors and local leadership in the success of community-based programs. In conclusion, the study's results indicate that while the community approach is not a stand-alone solution to combat infectious diseases, it has proven to be an important component that complements the formal healthcare system. By optimizing the role of the community, building social trust, and strengthening local networks, efforts to prevent and control diseases can be more effective, sustainable, and tailored to local contexts. This success model can be replicated in other areas by adapting it to the unique social and cultural characteristics of each region.

Strategic Role of Community-Based Approaches in Preventing Infectious Diseases

The community-based approach has proven to be a highly effective strategy in preventing and controlling infectious diseases, especially in areas with limited access to formal healthcare services. In this study's context, active community involvement in decision-making, program implementation, and evaluation builds a strong sense of ownership. This not only accelerates responses to emerging health issues but also creates ongoing collective awareness so that communities are not just passive recipients of aid but become agents of change in their own environments. This approach also aligns with the concept of Community-Based Participatory Research (CBPR), which places the community as an active subject in every stage of health intervention, making outcomes more relevant and targeted.

Health Cadres as Agents of Social Change

The role of health cadres in this study is crucial and multifaceted, as they not only act as health educators and promoters but also as case finders, patient companions, and liaisons between communities and formal health facilities. Because they come from the same environment as those they serve, these cadres have emotional and social proximity that makes health messages easier to accept and understand. Their humanistic approach helps to overcome stigma and embarrassment often associated with infectious diseases like tuberculosis, making patients more open to treatment and regular check-ups. Thus, strengthening the capacity of health cadres is a key part of a community-based public health system.

Strengthening Social Capital in Communities

The emergence of environmental care groups, dengue alert teams, and waste banks demonstrates that the community-based approach also strengthens local social capital. Social capital, consisting



of trust among residents, shared norms, and strong social networks, is an essential foundation that enables effective collaboration in preventive health activities. Social capital not only speeds up the adoption of healthy lifestyles but also enhances the community's social resilience in facing health challenges. This aligns with Putnam's (2000) theory that social capital is crucial for sustainable public health development and for mobilizing active community participation.

Impact of Social Structures and Local Leadership

Social and cultural contexts and local leadership are decisive factors in the success or failure of community-based programs. In this study, neighborhoods with active community leaders or religious figures involved in health activities showed much higher levels of participation and program effectiveness compared to areas with little local leadership. These figures have the ability to mobilize residents collectively and build trust in programs, making health initiatives more readily accepted and supported. Conversely, areas with high population mobility and weaker social ties face significant challenges in building active participation, ultimately hampering program success. These findings highlight the importance of tailoring approaches to local social and cultural contexts to ensure optimal outcomes for community health programs.

Challenges of Digital Literacy and the Role of Information Technology

While face-to-face, direct interaction remains very effective and essential, limited digital literacy and access to technology pose significant barriers to fast, accurate disease reporting and widespread health information dissemination. In this research context, many cadres and community members are not yet accustomed to using digital applications or IT-based communication platforms, limiting the potential of technology. Therefore, the gradual integration of information technology should be supported by digital literacy training for cadres and the provision of adequate infrastructure. In this way, technology can become a supportive tool for accelerating health information dissemination, case reporting, and coordination among stakeholders, aligning with the principles of digital transformation in public health systems.

Community Approaches as a Complement to Formal Health Services

The community-based approach to infectious disease control is not a substitute for formal health services but rather a complement that strengthens the entire health system. Through community empowerment, individuals and groups do not remain mere objects of health programs but become active subjects with control and responsibility for their own health. This aligns with the health empowerment principle in health promotion theory, which emphasizes that the success of health efforts depends on the ability of communities to make decisions and act collectively to maintain and improve their health. Therefore, the sustainability and effectiveness of health programs heavily rely on the synergy between community-based approaches and formal health service support.

CONCLUSIONS

This study shows that the community-based approach plays a crucial and effective role in the prevention and control of infectious diseases at the local level. Through community empowerment and the involvement of health volunteers from within the community, this approach has successfully increased awareness and promoted healthy living behaviors collectively, while also strengthening the social capital that forms the



foundation for solidarity and cooperation among residents. The success of the program is significantly influenced by local leadership and the social structures present in the community, making adaptation to local socio-cultural conditions a key factor. Although there are challenges in utilizing information technology, the community-based approach remains a strategic complement to formal health services to achieve the sustainability and effectiveness of infectious disease control. Thus, this model of community empowerment is worthy of being used as a reference and replicated in other areas with adaptations according to their respective local characteristics.

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