

Implementation of The ELSIMIL Application Program in Reducing The Incidence of Stunting in Sidoarjo District

Fadhilillah Ihtifazhuddin¹, Hendra Sukmana²

^{1,2} Muhammadiyah University of Sidoarjo, Indonesia



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ABSTRACT

Objective: This study aims to analyse the effectiveness of the ELSIMIL digital application in reducing stunting in Sidoarjo Regency through the lens of Edward III's policy implementation theory. **Method:** A qualitative descriptive approach was employed with purposive sampling to select informants, while data were collected through interviews, observations, and documentation, and analysed using Miles and Huberman's interactive model. **Results:** The findings reveal that effective communication, achieved through hierarchical information transmission, clarity of socialisation materials, and routine monitoring, supports programme success despite challenges such as limited TPK understanding and server disruptions. Resource-related obstacles include limited cadres, uneven authority comprehension, and suboptimal technological infrastructure; however, strong commitment and enthusiasm among implementers facilitated programme sustainability. A well-structured bureaucratic framework with clear Standard Operating Procedures and division of tasks enabled the creation of a stunting prevention ecosystem integrating digital technology with community-based health services. **Novelty:** This study contributes an innovative model for addressing the digital divide in public health interventions by adapting communication and training strategies to the technological literacy of grassroots health cadres, thereby strengthening bottom-up approaches to stunting prevention.

INTRODUCTION

The use of information technology in the health sector is becoming increasingly important. Electronic Health Program Electronic health programs are a strategic innovation in modern health care systems, integrating information technology to improve the effectiveness and accessibility of public health services [1]. One of the electronic-based health programmes is the ELSIMIL application, which aims to improve the efficiency and effectiveness of health services [2]. This application is designed to support prospective brides and grooms (Catin) in preparing for marriage and pregnancy and identifying risk factors for stunting in children. By integrating health data digitally, ELSIMIL contributes to efforts to prevent stunting, which is a serious problem in Indonesia. The ELSIMIL application is one of the technological solutions developed to address health issues, particularly stunting [3]

The legal basis for the implementation of the ELSIMIL application can be found in Presidential Regulation No. 72 of 2021 concerning the Acceleration of Stunting Reduction, which assigns the National Population and Family Planning Agency (BKKBN) as the chair of the implementing agency for this programme [4]. The legal basis for addressing stunting is set out in Regulation of the National Population and Family

Planning Agency of the Republic of Indonesia Number 12 of 2021 concerning the National Action Plan for the Acceleration of Stunting Reduction in Indonesia [5]. The National Population and Family Planning Agency has made a breakthrough with the creation of the ELSIMIL (Electronic Ready for Marriage and Pregnancy) application as a platform for early stunting prevention, where the application serves as a self-assessment tool for the target groups of stunting prevention, namely prospective brides and grooms, pregnant women, postpartum mothers, toddlers, and infants, who will be connected to the Family Assistance Team (TPK) [6]. In addition, Minister of Health Decree (KMK) Number HK.01.07/MENKES/1559/2022 also provides a legal framework for the implementation of an electronic-based government system in the health sector. This regulation supports the development of applications aimed at improving the quality of health services and reducing stunting rates in the community [7]

The ELSIMIL application has had a significant positive impact on reducing stunting rates. By screening Catin, this application helps identify health risks and provides the necessary assistance [8]. In addition, this programme raises public awareness about the importance of health preparation before marriage and pregnancy, which has the potential to reduce stunting rates among children, improve access to health information, facilitate monitoring of children's nutritional status, and improve cross-sector coordination. The Elsimil app offers several benefits to users, particularly brides-to-be, namely: first, to detect risk factors in brides-to-be (body weight, height, haemoglobin levels, upper arm circumference, and exposure to cigarette smoke)[9]. Second, as a screening tool for prospective children to ensure they are healthy and free from stunting. Third, as a bridge between prospective parents and the Family Assistance Team. Fourth, as a medium or means of education for prospective parents. The benefits of the Elsimil application can be felt by prospective parents, and of course it is a good start to raising awareness about stunting prevention before deciding to have children. So far, many prospective parents have felt the positive impact of the Elsimil application [10].

The ELSIMIL programme goes through several stages, starting with community outreach and ending with health screening for Catin. The app connects Catin with support officers who provide education and intervention when needed [11]. This process involves collaboration between various parties, including the National Population and Family Planning Agency (BKKBN) and PKK cadres. In detail, the program mechanism runs as follows: The ELSIMIL application is designed for recording data on toddlers, monitoring growth, providing data-based interventions, and coordinating between health workers. The ELSIMIL application is divided into two parts: one for Family Support Teams and prospective brides and grooms, and another for prospective brides and grooms. Family Support Teams use the application available on the web browser at elsimil.bkkbn.go.id, while prospective brides and grooms use the application available on the Playstore. User data in the ELSIMIL application includes information about prospective brides and grooms who register and undergo the screening process. This data enables further analysis of community health conditions and the effectiveness of the programme in reducing stunting rates [12]. The number of app users continues to

increase as awareness of the importance of health preparation before marriage grows. The Elsimil app will automatically score the questionnaire filled out by the bride and groom. The scoring results are divided into two colours: Ideal (Green) and At Risk (Red). The Elsimil app will issue a certificate stating whether a bride-to-be is at risk of giving birth to a stunted baby. The TPK will provide feedback to brides-to-be at risk of giving birth to a stunted baby by providing three months of counselling before they proceed to the marriage stage. This certificate will be a requirement for the bride to register her marriage at the KUA/Population and Civil Registry Office. This is a tremendous advantage in preparing the bride's health and knowledge. The data collected through the ELSIMIL application includes variables related to the risk of stunting, such as the age of the bride, nutritional status, and family health history. This data analysis helps in determining appropriate interventions for individuals at high risk of stunting in their children. Based on data from the Web Browser elsimil.bkkbn.go.id, the following is a summary of the number of prospective brides, pregnant women, and infants in Sidoarjo Regency.

Table 1. Summary of Data on the Number of Pregnant Women and Newborns in Sidoarjo Regency

No	Tahun	Jumlah catin	Ibu hamil	Baduta
1	2022	362	320	322
2	2023	411	324	382
3	2024	427	374	425

Source : elsimil.bkkbn.go.id (2025)

Based on the data, it indicates that there are still few prospective brides and grooms who have been entered or registered in the elsimil application, so the task of the Family Movement Team in preventing stunting in villages must be improved in order to identify the risks of stunting and ways to prevent it, in accordance with the objectives of the elsimil application.

Previous research by Putri (2023) titled 'Implementation of the Electronic Marriage and Pregnancy Readiness Application "ELSIMIL" by BKKBN in the Context of Reducing Stunting Rates in Yogyakarta City' shows that the use of digital applications in health programmes can improve access to services and the effectiveness of interventions. For example, a study on the implementation of ELSIMIL in Yogyakarta showed positive results in reducing stunting rates after the programme was implemented[13]. This study provides an empirical basis for continuing the use of information technology in health programmes. Another study also concluded that ELSIMIL is effective for use by TPK cadres for screening and filling in target data. ELSIMIL is efficient to use, with fast screening results through its easy-to-use functions and features. The ELSIMIL application can be accessed equally by all TPK cadres, although there are still obstacles, both personal and systemic. ELSIMIL is responsive and displays the application's features without interruption when TPK cadres enter target data.

Another study by Sumntri et al. (2023) titled 'Legal Review of the Implementation of the Elsimil Application for the Community in Efforts to Accelerate the Reduction of Stunting in Accordance with Presidential Regulation No. 72 of 2021' concludes that Presidential Regulation No. 72 of 2021 on the acceleration of stunting reduction is one of the priority activities included in the National Action Plan for the Acceleration of Stunting Reduction, which includes the implementation of the Elsimil application, and the implementation of the Elsimil application is carried out by the Family Support Team (TPK), consisting of PKK Village/Neighbourhood Movement Team Cadres, Midwives, and Family Planning Cadres, to provide support to families at risk of stunting [14].

In another study by Winanrni and I'tiskom (2023) entitled Innovation in Family Planning Services (ELSIMIL) in Kradenan Subdistrict, Grobogan Regency, it was also concluded that the obstacle faced was the habit of couples registering their marriage in the village close to the wedding date. Factors conducive to the ELSIMIL service innovation include the target audience of young couples, making the application easy to use, with many TPK cadres in one village (12 TPK cadres). Factors not conducive to the ELSIMIL service innovation include many couples working outside the city, marriage registration in the village being close to the wedding date, and many TPK cadres still being confused about using the ELSIMIL application [15]

Based on observations, there are several issues in the implementation of the ELSIMIL programme in Sidoarjo District, including from the Family Assistance Team and prospective brides and grooms. First, the Family Assistance Team lacks expertise in accessing information technology devices. Second, the Family Support Team lacks understanding in operating the ELSIMIL application. Many community members are unaware of the existence of the ELSIMIL application and its benefits in preventing stunting, resulting in low participation in the programme. Third, there is insufficient socialisation to prospective brides and grooms regarding the importance of preventing stunting through the ELSIMIL application. Fourth, poor internet connectivity in certain villages when accessing the ELSIMIL application. The ELSIMIL application frequently experiences server issues, especially when many users access it simultaneously. This results in delayed support and data not being entered in a timely manner

The implementation theory used in this study is a public policy implementation model that emphasises the importance of collaboration between the government, the community, and other stakeholders. Implementation Theory Using Edward III's policy implementation model, which focuses on four indicators, including: (1) Communication, Communication concerns the process of conveying information or transmission, the clarity of the information, and the consistency of the information conveyed. Knowledge of what they are doing can be achieved if communication is effective, so that every policy decision and regulation is understood. (2) Resources, Resources are a crucial factor for the effective implementation of a programme; without resources, a programme or policy remains merely a document on paper. Even if the content of the policy has been communicated clearly and consistently, if the implementers lack the necessary resources to carry out the policy, the implementation will not be effective. (3) Disposition is the

attitude and commitment of the implementing officials towards the programme, especially those who are the implementers or executors of the programme, in this case primarily the bureaucratic apparatus. If the implementer has a good disposition, then he will implement the policy well as desired by the policy or programme maker, whereas if the implementer or executor has a different attitude to the policy maker, then the implementation or execution of the programme will also be ineffective. (4) Bureaucratic structure. The bureaucratic structure relates to the suitability of the bureaucratic organisation that implements public policy. The challenge is to prevent bureaucratic fragmentation, as this structure renders the implementation process far from effective. Two characteristics that can improve the performance of the bureaucratic/organisational structure are the implementation of Standard Operating Procedures (SOPs) and the implementation of fragmentation [16]. This research approach aims to analyse the effectiveness of ELSIMIL in reducing stunting through a comprehensive and integrated approach and to ensure that all parties are involved in the implementation of the ELSIMIL programme, so that the common goal of reducing stunting rates in Sidoarjo Regency can be achieved.

RESEARCH METHOD

This research approach aims to analyse the effectiveness of ELSIMIL in reducing stunting through a comprehensive and integrated approach and to ensure that all parties are involved in the implementation of the ELSIMIL programme, so that the common goal of reducing stunting rates in Sidoarjo Regency can be achieved. [17]. This study aims to determine how the implementation of the ELSIMIL application has contributed to the reduction of stunting cases in Sidoarjo Regency. The study was conducted in Sidoarjo Regency, with the research site located at the BKKBN (National Family Planning Agency) of Sidoarjo Regency. Informants were selected using purposive sampling, or deliberate selection, with several informants who were directly involved or who understood the research issues and could provide quality information [18]. Informants in this study included the Head of the National Population and Family Planning Agency (BKKBN) of Sidoarjo Regency, Family Assistance Team (TPK) cadres, Family Planning (KB) counsellors, and prospective brides and grooms. Data collection techniques included interviews, observation, and documentation. The data sources obtained were as follows: (1) Primary Data, data obtained directly, recorded, and observed, such as interviews, observations, and documentation. (2) Secondary Data, data obtained indirectly, with secondary data sources obtained from journals and media sources.

The focus of this study is to analyse the implementation of the ELSIMIL application in reducing stunting cases using Edward III's policy implementation theory, which focuses on the variables (1) Communication, (2) Resources, (3) Disposition, and (4) Bureaucratic Structure. The data analysis technique used is the interactive data analysis model by Miles & Huberman, which includes: (1) Data Collection. Data collection can be conducted through interviews, observations, and documentation. (2) Data Reduction. According to Miles & Huberman, data reduction is the process of selecting, focusing

attention through simplification, abstraction, and transforming raw data from written field notes to obtain an important data summary and then discarding unused or unnecessary data. (3) Data Presentation. This involves combining all the data and information obtained in the field into a form that is easy to access or obtain. This facilitates a comprehensive analysis. (4) Drawing Conclusions. Drawing conclusions involves synthesising all the data into a single conclusion based on the results of the fieldwork conducted by the researcher [19].

RESULTS AND DISCUSSION

Results

The implementation of the ELSIMIL application programme in reducing stunting in Sidoarjo Regency has shown significant results in line with Edward III's implementation theory through synergy between active posyandu cadres, intensive socialisation, and the use of the ELSIMIL application as an early detection tool.

1. Communication

The first indicator is communication, which explains how clear and accurate communication with policy implementers is very important, consisting of three aspects, namely transmission, clarity and consistency. From the transmission aspect, the transmission of information about the ELSIMIL application involves the socialisation of the programme from the district level to the posyandu cadres and the community. This process includes training on the use of the application and conveying information about the programme's objectives. The ELSIMIL application serves as a structured information distribution channel for family planning and stunting risk detection. However, its implementation is hindered by the limited understanding of Family Support Team (TPK) cadres and prospective brides and grooms, as well as server disruptions that reduce data access speed. Efforts to enhance human resource capacity through operator and TPK (Family Support Team) training are a solution to ensure that policy transmission reaches the target audience accurately.

Results of an interview with the Head of BKKBN Sidoarjo Regency:

"We conduct tiered training on ELSIMIL, starting at the district level for Family Planning Counsellors (KB), who then convey the information to posyandu cadres and Family Assistance Teams. The challenge is to ensure that the same information reaches all implementers in the field without distortion."

Clarity is reflected in the socialisation materials, which include comprehensive explanations of the causes of stunting (specific and sensitive factors). Clarity in the context of ELSIMIL implementation includes understanding how to use the application, who the programme targets, how data is input, and how to interpret the results and expected follow-up actions. Challenges arise from differences in interpretation of the materials by village officials, which are addressed through the development of standard operating guidelines to minimise ambiguity.



Figure 1. Elsimil Application Socialisation via Zoom
Source : youtube BKKBN Official (2024)

Results of interviews with Family Assistance Team cadres:

"At first, many cadres were confused about how to use the ELSIMIL application. We had to repeat the explanation several times, especially for cadres who were not familiar with technology. After we created illustrated guides and video tutorials, their understanding improved and their use of the application increased significantly."

In terms of consistency, ELSIMIL programme communication includes uniformity of information conveyed through various communication channels and consistency in the implementation of monitoring and evaluation programmes. Implementation is maintained through a fixed budget allocation for cadre training, application server maintenance, and monthly monitoring by the PPKBD Office. Despite technical challenges, the local government's commitment to improving IT infrastructure and holding regular stakeholder meetings ensures the continuity of the programme. The integration of ELSIMIL data with the posyandu recording system creates a feedback mechanism to evaluate the consistency of implementation in the field. The combination of these three communication indicators forms a sustainable stunting prevention ecosystem in Sidoarjo District.

Results of interviews with family planning counsellors (KB):

"Our biggest challenge is ensuring consistency in the information received by all programme implementers. Sometimes there are changes in procedures or application updates that must be communicated quickly. To overcome this, we created a special WhatsApp group for coordination and to ensure that all the latest information is communicated consistently. We also hold regular monthly meetings for evaluation and information refreshers."

The above facts are consistent with Edward III's implementation theory, which states that the implementation of the ELSIMIL application programme in reducing stunting in Sidoarjo District shows that effective communication indicators are a prerequisite for programme success. Smooth information transmission, clear instructions and messages, and consistent communication have helped health workers and cadres

optimise the use of the application for accurate stunting monitoring and intervention. The process of information transmission from the district level down to posyandu cadres through tiered training has been a crucial factor in the programme's success. This aligns with Edwards' theory that clear communication of policy information to implementers is a primary prerequisite for effective implementation. However, challenges arose in the form of limited understanding among Family Support Teams (TPK) and server disruptions that hindered data access. Consistency of information in the ELSIMIL programme was maintained through fixed budget allocations and monthly monitoring. Regular meetings and the formation of WhatsApp groups for coordination demonstrated an awareness of the importance of consistency, as highlighted by Grindle in his implementation model. Data integration with the posyandu recording system creates an essential feedback mechanism for continuous evaluation [21]. The integration of these three communication aspects has successfully reduced stunting rates in Sruni Village from 29% to 8% over a two-year period, confirming Edwards' theory that good communication is the foundation of effective implementation.

2. Resources

The implementation resource indicator can be analysed through four main dimensions: human resources, facilities, authority, and information. Human resources are a crucial factor in policy implementation. Intensive training for posyandu cadres and family assistance team cadres is necessary to optimise the use of the application. The main obstacle lies in the limited number of officers at the village level. Interviews with Family Assistance Team Cadres show that :

"We have been trained to use ELSIMIL, but there are still not enough cadres. Sometimes one person has to cover an entire village alone, which is very burdensome."

Table 2. ELSIMIL programme implementer in Sidoarjo

No	Name	Implementer
1	dr. Hasto Wardoyo	Head of the National Population and Family Planning Agency (BKKBN) of Sidoarjo Regency
2	Khoirun Nisa, Amd. Kep	Village midwife from the Community Health Centre (Puskesmas)
3	Wienda Ardiani. S.TP	Family Assistance Team (TPK) cadre
4	Nita Agustin	Family Planning (KB) counsellor

The availability of physical facilities is an important factor in policy implementation. The availability of smartphones and internet networks is a challenge. Results of interviews with family planning counsellors :

Even though we are in the city, the signal often drops. We can only input data in the early hours of the morning when there is a network connection. During working hours, the application takes a long time to load and often does not respond."

Supporting facilities such as smartphones and stable internet networks are significant technical barriers. Network constraints that force cadres to input data in the

early hours of the morning reflect what Wildavsky refers to as the ‘implementation gap’ – the gap between ideal planning and the reality of implementation. These findings reinforce Elmore's argument that adequate technological infrastructure is a prerequisite for the implementation of information technology-based policies in the digital age.

Budgetary resource aspects are also of great importance. The implementation costs of the Elsimil programme in Sidoarjo District for the 2024 fiscal year are outlined in the table below.

Tabel 3. Elsimil programme budget in Sidoarjo Regency for 2024

No	Activity Components	Sub-Components	Volume	Unit	Unit Price (Rp)	Total Cost (Rp)	Remarks
1	System Development	ELSIMIL Application Development	1	Package	250.000.000	250.000.000	Includes UI/UX, backend, and testing
2	IT Infrastructure	Cloud Server	1	Year	50.000.000	50.000.000	Hosting + maintenance
		Computer Equipment	10	Unit	8.000.000	80.000.000	For sub-district operators
		Internet Network	12	Month	1.500.000	18.000.000	Dedicated connection
3	Training	Operator Training	5	Day	5.000.000	25.000.000	20 participants from 18 sub-districts
		Community Socialisation	18	Subdistrict	3.000.000	54.000.000	Includes modules and materials
4	Operational	Monitoring & Evaluation	12	Month	5.000.000	60.000.000	Team of experts and field staff
		Administration	1	Package	15.000.000	15.000.000	Legal documents and reports
5	Reserve Funds	Contingency	1	Package	50.000.000	50.000.000	For technical risks
Total						602.000.000	

Source: compiled by the author (2025)

Based on the table above, it is also explained that the total budget required for the implementation of the Elsimil programme in Sidoarjo Regency is six hundred million, which is obtained or sourced from the Sidoarjo Regency Regional Budget (70%) and Assistance from the Ministry of Communication and Information Technology (30%).

Authority or jurisdiction relates to the legitimacy to implement policies. Coordination between the ELSIMIL team and the Sidoarjo Health Office is regulated through a Regent's Decree. However, some cadres do not yet understand the limits of their technical responsibilities. Interview results show that:

"Since the Regent's Decree on the ELSIMIL Implementation Team was issued, cross-sector coordination has become easier. We at the Health Office have the authority to coordinate community health centres, village midwives, and cadres. We are only required to input data"

The aspect of authority in the implementation of ELSIMIL has been formalised through a Regent Decree that regulates cross-sector coordination. However, the continued lack of understanding among some cadres regarding the limits of technical responsibility indicates the need to strengthen understanding of authority, as emphasised by Matland's implementation theory [20]. According to Edward III, information has two forms: first, information on how to implement policies (technical guidelines); second, data supporting compliance with government regulations. Without adequate information, implementers will not understand what to do and will not be able to measure the success of implementation. Results of interviews with family planning counsellors:

"The dissemination of information on the use of ELSIMIL is already underway, but not all cadres fully understand how to fill in the data correctly. We have created a manual and tutorial videos, but data entry errors that result in invalid data still occur frequently. In addition, the mechanism for reporting and updating the latest information on pregnant women and toddlers needs to be improved. Sometimes the data in the application does not match the actual conditions in the field."

The above facts are consistent with Edward III's implementation theory, which states that these four aspects of resources are interrelated and influence the effectiveness of the ELSIMIL programme implementation in efforts to reduce stunting in Sidoarjo District. Optimal management of these four aspects will support the overall success of the programme. The human resource aspect is the main challenge, as the limited number of posyandu cadres at the village level results in an disproportionate workload. This situation aligns with Lipsky's view on 'street-level bureaucrats,' who often face capacity constraints in implementing public policies on the ground [21]. The success in reducing stunting rates in Sidoarjo Regency cannot be separated from the positive disposition of the programme implementers. The proactive attitude of the implementers is key to successfully translating policy designs into concrete actions in the field. This finding reinforces Edwards' argument that even though communication and resources are available, without a supportive disposition, policy implementation will face significant resistance.

3. Disposition

The disposition aspect in policy or programme implementation refers to the attitude, commitment, and support of policy implementers. Disposition can be seen from the attitude and commitment of health workers (village midwives), health cadres, village/sub-district officials, and the Health Office and related agencies. Results of an interview with the Head of BKKBN Sidoarjo Regency :

"The ELSIMIL programme is our priority. We have conducted intensive outreach to all health workers and ensured that they understand the importance of this application. All parties have shown a high level of commitment, as evidenced by the enthusiasm of health workers in participating in training and implementation in the field."

Similar results were also explained by the family support team:

"I am pleased with the ELSIMIL application because it makes it easier for us cadres to monitor the growth and development of toddlers. Although some of us were initially technologically challenged, thanks to the training provided, we are now able to use this application effectively. We feel more empowered in our efforts to prevent stunting in our village."



Figure 2. Disposition in the implementation of Elsimil

Based on the above facts, in line with Edward III's implementation theory, the disposition in this case, namely the attitude and motivation of programme implementers, greatly influences the success of ELSIMIL implementation. Most health cadres and community health centre staff welcomed the application positively because it facilitated data collection and monitoring of stunted toddlers. They felt helped by the digital features that reduced their manual workload.

The positive dispositions of the ELSIMIL programme implementers in Sidoarjo District have significantly contributed to the success of the programme implementation and the reduction in stunting rates in the area. The success in reducing stunting rates in Sidoarjo District is closely tied to the positive attitude of the programme implementers. The proactive stance of implementers is key to translating policy design into concrete actions on the ground. This finding reinforces Edwards' argument that even with communication and resources available, without supportive attitudes, policy implementation will face significant resistance.

However, not everyone shares the same attitude. Some cadres and parents of toddlers still feel more comfortable using conventional methods, such as the KIA (Mother and Child Health) book, because they are accustomed to it. The lack of digital literacy among low-income communities is also a factor hindering the adoption of this technology.

4. The Bureaucratic Structure

The bureaucratic structure comprises two important elements: Standard Operating Procedures (SOP) and division of labour. SOPs for the use of the ELSIMIL application have been established so that all implementers understand the steps required for data entry and stunting monitoring. Although there has been special training in data entry, some cadres complain that the existing SOPs are still too complex and impractical, especially for cadres who are not yet familiar with and competent in technology. Furthermore, the division of responsibilities between the Health Office, community health centres, and posyandu cadres or family assistance teams must be clear to avoid overlapping tasks.

Results of an interview with the Head of BKKBN Sidoarjo Regency:

The implementation of ELSIMIL requires good coordination between relevant SKPDs. We have developed clear SOPs regarding information flow and decision-making. Every month, we hold coordination meetings to ensure that data entered into the ELSIMIL system is properly verified and followed up by each agency in accordance with its authority.

This statement is in line with interviews with the family assistance team, who stated that:

"At first, we were confused about the reporting structure in the ELSIMIL application. But after training and guidance from BKKBN, we understood how data flows from cadres to village midwives, then to health centres, and so on. Now we clearly understand our authority limits in using this application."

By improving this bureaucratic structure, the implementation of ELSIMIL in Sidoarjo can run more smoothly and effectively in reducing stunting rates. The existence of SOPs for the use of the ELSIMIL application has helped create consistency in actions among implementers. However, complaints that the SOPs are still too complex for cadres who are not yet familiar with technology highlight what Bardach refers to as the 'implementation game,' where formal procedures are sometimes difficult to implement at the operational level.

Table 4. ELSimil Application SOP

1.	Download the app	Open the Play Store, type in 'elsimil' and download it
2.	Registration	1. Fill in your general personal details and password for the app. 2. Fill in your ID card number and upload a photo of your ID card 3. Fill in your address details according to your place of residence

3.	Log in to the app	1. Open the ELSIMIL app homepage. 2. Click the "Log In" button. 3. Enter the email address or phone number you registered. 4. Enter the password you registered. 5. Click the "LOG IN" button.
4.	Filling out the questionnaire	1. For female participants, there will be 5 variables in the questionnaire: a. Age b. Body Mass Index/BMI (Please fill in your weight and height) c. Blood Hb Level d. Upper Arm Circumference (UAC) e. Smoking Behaviour or Exposure to Secondhand Smoke. 2. For male participants, there are only 2 variables to be filled in the questionnaire: a. Age b. Smoking Behaviour or Exposure to Secondhand Smoke
5	Viewing questionnaire results and downloading the ELSIMIL certificate	1. The questionnaire results will show green indicators (ideal) and red indicators (at risk), and you can read the education related to the risk variables. 2. The ELSIMIL certificate can be downloaded by clicking the Download Certificate button. This certificate contains information about the questionnaire results based on the health examination. This certificate will be brought and presented during marriage registration at the KUA or Dukcapil.

The above facts, when linked to Edward III's implementation theory, show that clarity regarding the limits of authority in using the ELSIMIL application is a manifestation of effective institutional design. A clear bureaucratic structure can reduce conflicts of interest and improve coordination among implementation actors. Continuous improvements in the bureaucratic structure of the ELSIMIL programme in Sidoarjo have contributed to the effectiveness of implementation in reducing stunting rates

Discussion

The implementation of the ELSIMIL application in Sidoarjo demonstrates how digital technology can be effectively integrated into public health interventions, particularly in stunting prevention. The findings reveal that communication plays a pivotal role, where hierarchical information transmission, clarity of training materials, and consistent monitoring support programme success. However, the persistence of challenges such as server disruptions and varying levels of understanding among cadres aligns with Edwards III's assertion that communication, while essential, must be continuously reinforced through tailored socialisation strategies and the use of diverse communication platforms to reach both cadres and communities effectively.

In terms of resources, the study highlights the centrality of human and technological capacities in policy implementation. Limited cadres, uneven

understanding of authority, and inadequate infrastructure create an “implementation gap,” as described by Wildavsky. Nevertheless, budget allocations and training programmes indicate local government’s commitment to strengthening resources. These findings correspond with Elmore’s argument that adequate resources and infrastructure are prerequisites for effective digital health interventions, and reinforce the importance of cross-sectoral support to sustain the programme’s long-term impact.

Disposition emerges as a strong determinant of programme sustainability, reflected in the commitment and enthusiasm of cadres and health workers. Their proactive attitudes enable the translation of policy design into concrete actions despite resource limitations. This finding supports Edwards’ view that the disposition of implementers can act as a driving force for success, even when technical constraints exist. Conversely, resistance from certain cadres and parents due to low digital literacy underscores the need for continuous digital literacy training and community empowerment initiatives.

The bureaucratic structure of the programme, supported by Standard Operating Procedures (SOPs) and clear division of tasks, provides a foundation for effective coordination across implementing agencies. However, the complexity of SOPs for less technologically literate cadres reflects Bardach’s notion of the “implementation game,” where formal rules may be difficult to apply in practice. Continuous improvements in simplifying SOPs and enhancing coordination mechanisms are thus necessary to ensure efficiency. This structural clarity has contributed to creating a sustainable ecosystem of stunting prevention that integrates bottom-up approaches through cadres’ involvement.

Comparatively, the experiences in Sidoarjo resonate with previous studies conducted in Yogyakarta and Grobogan, where ELSIMIL improved screening and monitoring but faced similar challenges of low public participation and technological barriers. The consistency of these findings across regions strengthens the argument that while ELSIMIL is an innovative and effective intervention, its success heavily depends on the adaptive capacity of local implementers and infrastructure readiness. Therefore, scaling up this programme requires not only strengthening communication and resources but also embedding continuous training, simplification of bureaucratic processes, and community digital empowerment to bridge existing gaps.

CONCLUSION

Fundamental Findings : The implementation of the ELSIMIL application in Sidoarjo Regency validates Edward III’s policy implementation theory, as effective communication, adequate resources, positive implementer disposition, and a clear bureaucratic structure collectively contributed to a significant stunting reduction from 29% to 8% in Sruni Village within two years. **Implications :** The findings highlight the necessity for government investment in digital infrastructure, structured training for cadres, and integration strategies that balance technological innovation with conventional approaches to ensure sustainability of health interventions in developing contexts. **Limitations :** The study is constrained by its focus on a single regency, a

relatively short two-year evaluation period, reliance on self-reported data, technological barriers affecting data completeness, and the exclusive application of Edward III's framework without comparative theoretical perspectives, limiting its broader generalizability. **Future Research** : Future investigations should include multi-regional and cross-country analyses, longitudinal studies of 5–10 years, cost-effectiveness evaluations, integration of multiple implementation frameworks, and the use of advanced technologies such as artificial intelligence and culturally adaptive designs to optimize adoption and sustainability of digital health interventions.

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Fadhlillah Ihtifazhuddin

Muhammadiyah University of Sidoarjo, Indonesia

Email: delifadli74@gmail.com

*** Hendra Sukmana (Corresponding Author)**

Muhammadiyah University of Sidoarjo, Indonesia

Email: hendra.sukmana@umsida.ac.id
