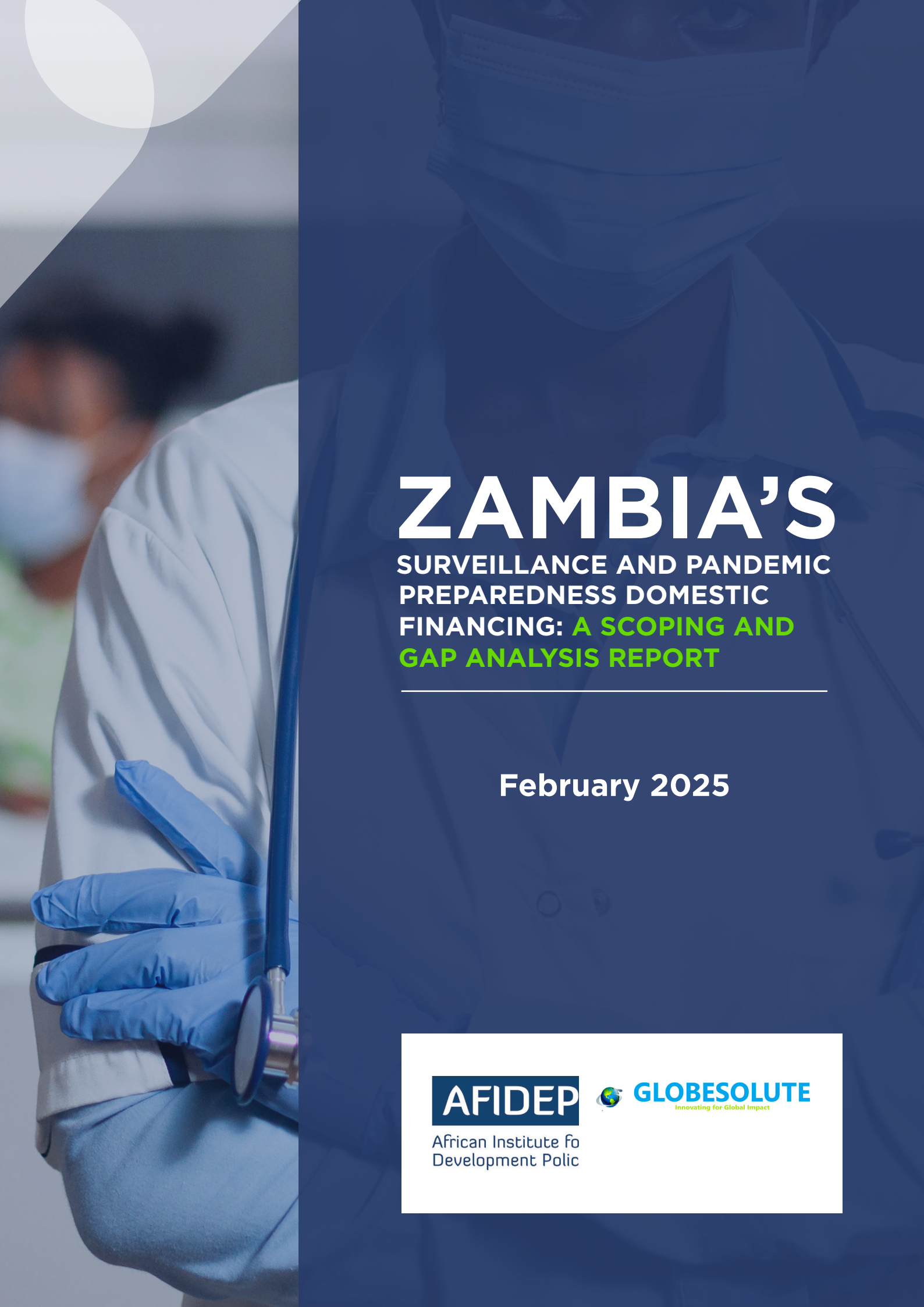




ZAMBIA'S

SURVEILLANCE AND PANDEMIC
PREPAREDNESS DOMESTIC
FINANCING: **A SCOPING AND
GAP ANALYSIS REPORT**

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Acronyms and Abbreviations

ALM	African Leadership Meeting
AU	African Union
BoZ	Bank of Zambia
CBO	Community-Based Organisations
CDC	Centers for Disease Control and Prevention
CHE	Current Health Expenditure
COVID-19	Coronavirus Disease 2019
DAH	Development Assistance for Health
DMMU	Disaster Management and Mitigation Unit
FAO	Food and Agriculture Organisation
e-IDSR	Electronic Integrated Disease Surveillance and Response
EBS	Event-Based Surveillance
GHED	Global Health Expenditure Database
GHSI	Global Health Security Index
IDSR	Integrated Disease Surveillance and Response
LICs	Low-Income Countries
LMICs	Lower-Middle-Income Countries
MOH	Ministry of Health
NPHEF	National Public Health Emergency Fund



NGO	Non-governmental organisations
NHA	National Health Accounts
NHSP	National Health Strategic Plan
OHSP	One Health Strategic Plan
PHC	Primary Healthcare
PHEF	Public Health Emergency Fund
PPR	Surveillance and Pandemic Preparedness and Response
SADC	Southern African Development Community
SDGs	Sustainable Development Goals
SSA	Sub-Saharan Africa
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WHO	World Health Organisation
WHO AFRO	World Health Organisation Regional Office for Africa
ZNPHI	Zambia National Public Health Institute

List of figures

Figure 1: Allocations to Preventive and Promotive Health Services, and Disease Surveillance and Response as a % of the Total Health Budget in Zambia.....	11
Figure 2: Expenditure on Epidemiological surveillance and risk and disease control programmes % Current health expenditure (CHE) in SADC region.....	14
Figure 3: Global Development assistance for health (COVID-19) during the pandemic, 2020–2023 (000, USD).....	15

List of tables

Table 1: Comparison of Inclusion of PPR in National Health Plans for Zambia.....	7
Table 2: Trends in Zambia's spending on epidemiological surveillance and risk and disease control programmes (in Zambian Kwacha).....	12
Table 3: Health Funding and Preparedness Gaps in Zambia.....	16
Table 4: National level financing requirements of the PPR by income group (in US\$ billion)...	17
Table 5: National health and PPR spending estimates.....	18
Table 6: International financing gap for national needs.....	18
Table 7: Constraints in Implementing PPR Programs in Zambia.....	23
Table 8: Inefficiencies in Resource Allocation and Use for Health PPR in Zambia.....	26
Table 9: Summary of stakeholders in PPR in Zambia.....	29

Table of Contents

List of Acronyms and Abbreviations.....	ii
List of figures and tables.....	iv
Executive Summary.....	vi
1.0 Background.....	0
1.1 Objectives.....	2
3.0 Methodology.....	3
3.1 Review Design	3
3.2 Data Collection Methods.....	3
3.2.1 Document analysis.....	3
3.2.2 Stakeholder Consultations.....	4
3.2.3 Triangulation and Validation.....	4
3.3 Data Analysis Techniques.....	5
3.4 Report setting.....	5
3.5 Ethical Considerations.....	5
3.6 Limitations of the report.....	6
4.0 Findings.....	6
4.1 Inclusion of Surveillance and PPR in Health Sector Plans.....	6
4.2 Integration of Surveillance and PPR financing into national budgets.....	9
4.3 National Budgetary allocations to PPR.....	11
4.4 Level and sources of Health Expenditure on PPR.....	13
4.5 Financing Gaps and needs for implementation.....	16
4.6 Resource pooling and financing mechanisms for PPR.....	20
4.7 Constraints in implementing PPR Programs.....	23
4.8 Sources of inefficiency in the use of PPR resources.....	30
4.9 Stakeholders in Surveillance and PPR.....	32
5.0 Summary of findings and recommendations.....	37
5.1 Summary findings.....	37
5.2 Recommendation.....	38
6.0 Conclusion.....	40
7.0 References.....	41

Executive Summary

Zambia's ability to respond effectively to health crises remains severely compromised due to chronic underfunding and fragmented financing mechanisms for surveillance and pandemic preparedness and response (PPR). Despite the devastating impact of COVID-19, which exposed the country's fragile health infrastructure, Zambia continues to allocate less than 1% of its national health budget to PPR, leaving it highly vulnerable to recurrent outbreaks of cholera, Mpox, and other emerging health threats. While the ZNPHI is mandated to lead health security efforts, its operations remain underfunded and heavily dependent on donor support, with more than 80% of Zambia's PPR financing coming from external sources. This overreliance on unpredictable donor funding has resulted in financial instability, inconsistent program implementation, and an inability to sustain long-term pandemic preparedness efforts. These vulnerabilities have been further exacerbated by the recent 2025 U.S. foreign aid freeze, which has halted USAID-backed health programs across Africa, delaying critical funding for Zambia's disease surveillance and emergency response initiatives. Furthermore, the U.S. withdrawal from the WHO has disrupted global pooled financing streams, reducing Zambia's access to essential health security resources.

Beyond funding shortages, Zambia faces systemic inefficiencies that further erode the effectiveness of its PPR programs. Delayed fund disbursement, misallocation of resources, procurement inefficiencies, and weak inter-agency coordination have repeatedly hindered the country's ability to respond swiftly to public health emergencies. The

to public health emergencies. The absence of a structured financial framework for PPR within the national budget means that available resources are often redirected to short-term priorities, leaving essential areas—such as disease surveillance, laboratory capacity, workforce training, and emergency stockpiles—severely underfunded. The proposed National Public Health Emergency Fund (NPHEF), which could provide a sustainable domestic financing solution, remains stalled due to fiscal constraints and policy bottlenecks, leaving Zambia without a dedicated rapid-response mechanism for future outbreaks. The uncertainty surrounding PEPFAR funding, which has historically played a crucial role in strengthening public health systems and mitigating pandemic risks, adds another layer of financial instability, further underscoring the urgent need for domestic resource mobilisation. While Zambia has made commitments to strengthening its PPR financing, these efforts lack urgency and strategic focus. Unlike South Africa's Solidarity Fund or Botswana's integrated health financing model, Zambia has yet to establish a sustainable approach to funding its health security. In its current state, Zambia's health system remains reactive rather than proactive, responding to health crises only after outbreaks occur, rather than investing in prevention and preparedness. If these gaps are not addressed, the country risks repeating the mistakes of the past—where underfunding, weak governance, and donor dependency lead to unnecessary loss of lives, economic strain, and prolonged health crises.

Call to action

To bridge the financing gap and strengthen Zambia's health security, the government must take decisive action:

- Ensure increased direct funding allocations to ZNPHI to guarantee sustainable financing for disease surveillance and emergency preparedness.
- Operationalise the NPHEF to provide rapid-response financing for outbreaks, reducing reliance on donor-driven emergency relief.
- Develop innovative domestic financing mechanisms such as public-private partnerships, health security levies, insurance-backed funding models to diversify revenue sources.
- Reform governance and accountability structures to eliminate inefficiencies in fund disbursement, procurement, and resource allocation, ensuring that available funds reach critical PPR programs.
- Enhance regional collaboration through SADC to create a pooled financing mechanism that strengthens collective pandemic preparedness across Southern Africa.

Failure to act now will leave Zambia's health system perpetually unprepared for the next pandemic, resulting in avoidable public health and economic disasters. The time for reactive, short-term measures is over—Zambia must urgently invest in sustainable, proactive health

1.0 Background

Significant gaps persist in critical areas, including infrastructure development, workforce capacity, access to essential medicines, health information systems, and pandemic preparedness (African Development Bank Group, 2022). These gaps are compounded by inefficiencies in resource utilisation, heavy debt burdens, low socioeconomic status, and inadequate health literacy. The growing adverse effects of climate change further strain already limited health systems. Together, these challenges severely undermine the region's capacity to build robust public health systems, particularly in Surveillance and Pandemic Preparedness and Response (PPR) (African Development Bank Group, 2022; Oleribe et al., 2019). Effective PPR requires robust surveillance systems, laboratory capacity, emergency preparedness mechanisms, and a trained workforce to identify and mitigate health risks early.

However, Zambia's PPR systems, like those in many SSA nations, remain underfunded and deprioritised in favour of curative health services that yield immediate, visible outcomes (WHO et al., 2022b)

The COVID-19 pandemic starkly demonstrated the consequences of underfunding PPR. It exposed significant gaps in Africa's health systems, including preventable loss of life, economic strain, and prolonged recovery periods. Zambia's heavy reliance on donor funding during the pandemic revealed vulnerabilities to external disruptions, including global financial shocks. Short-term, reactive financing decisions often bypassed long-term investments in resilience, leaving systemic weaknesses unaddressed. In

some instances, mismanagement and abuse of COVID-19 funds eroded public trust in Zambia's health systems, compounding existing challenges (African Development Bank Group, 2022; ZNPHI, 2023).

Beyond COVID-19, Zambia faces recurring health threats such as seasonal cholera outbreaks, driven by poor sanitation and water access, and recent cases of Mpox (Mazaba ML, 2023). These crises highlight the critical need for sustainable domestic financing and robust surveillance systems (Mazaba, 2023; ZNPHI, 2023). Strengthening primary healthcare (PHC) is equally essential for effective PPR. PHC empowers communities to detect and report threats early, build public trust, and ensure resilient responses to emergencies. Investments in PHC alongside surveillance infrastructure, laboratory systems, and workforce training can significantly reduce reliance on donor interventions (Mosadeghrad et al., 2024; ZNPHI, 2023).

Recognizing these vulnerabilities, Zambia has taken steps to enhance domestic investments in health. Through the National Health Financing Dialogue, Zambia has committed to increasing domestic resource mobilisation and is making progress in implementing the African Leadership Meeting (ALM) Declaration, which prioritises sustainable financing (MOH, 2023). These efforts align with Zambia's strategic focus on reducing donor dependency and institutionalizing robust health financing for PPR (African Union, 2024).

These investments are also fundamental to achieving Universal Health Coverage (UHC), ensuring that essential health services remain accessible, equitable, and uninterrupted, even in times of crisis.

Despite these efforts, substantial gaps remain in Zambia's PPR capacities, particularly in surveillance infrastructure, laboratory networks, and emergency preparedness mechanisms (ZNPHI, 2023). Limited literature exists on financing gaps and their drivers in Zambia, underscoring the importance of this report. This report is particularly timely given the recent 2025 U.S. foreign aid freeze, which has disrupted key global health funding streams, including USAID-backed PPR programs, highlighting Zambia's urgent need for sustainable domestic financing (Imray et al., 2025). Additionally, the U.S. withdrawal from the WHO threatens Zambia's access to international health security funding, further reinforcing the necessity of strengthening regional and domestic financial mechanisms for PPR (Kyobutungi, 2025). Through an analysis of national health strategies, budgets, expenditures, published research, and grey literature, this report assesses Zambia's PPR financing landscape while providing insights applicable to the broader African context.

Zambia's strategic role as the host of the Africa CDC Southern Africa Regional Collaborating Centre (RCC) further underscores its responsibility to lead regional health security efforts (Africa CDC, 2021). Fulfilling this mandate requires substantial, long-term investments in PPR systems to address recurrent challenges like cholera, emerging threats such as Mpox, and future pandemics (Mazaba, 2023; WHO

2023; WHO et al., 2022b). This report seeks to identify programmatic and financial gaps and provide actionable recommendations to support Zambia in strengthening health system resilience and sustainability.

1.1 Objectives

The primary objective of this scoping report is to evaluate the state of domestic health financing for PPR in Zambia and across sub-Saharan Africa (SSA). Specifically, the report seeks to:

I. Identification of Opportunities: The report will uncover opportunities to enhance financing and programming for PPR in Zambia, providing actionable insights for the country and extending relevance to the broader SADC regions.

II. Informed Decision-Making: Findings will provide a foundation for engaging Zambia in evidence-based dialogue, supporting their decision-making and actions on financing PPR initiatives.

III. Lessons for Regional Sharing: The report will identify key lessons and best practices from Zambia that can be shared across the SADC regions to inspire improvements in other member states.

IV. Increased Commitment to Health Financing: By fostering dialogue and collaboration, the report aims to stimulate interest and action among other member states, promoting greater commitment to sustainable health financing.

V. Catalyzing Domestic Funding: Ultimately, the findings and engagements are expected to contribute to increased domestic funding for PPR across Africa, strengthening the continent's health systems and pandemic preparedness.

These outcomes will help build momentum for a coordinated regional approach to addressing PPR financing challenges and ensuring sustainable investments in health security.

3.0 Methodology

3.1 Review Design

This scoping review employed a desk review approach to analyse health financing for PPR in Zambia, within the broader context of the SADC regions. The methodology focused on synthesizing existing data from secondary sources to provide insights into financing gaps, resource allocation, and policy frameworks relevant to PPR. Publicly available national budgets, financial records, institutional policies, and regional strategies formed the primary data sources, offering a comprehensive understanding of the current landscape. To enrich the analysis and validate findings, insights were sought through consultations with key organisations and stakeholders in the health financing and PPR space. This iterative approach facilitated the identification of challenges and opportunities in health financing for PPR, providing actionable recommendations for Zambia, and the broader SADC regions.

3.2 Data Collection Methods

The data collection process was designed to align with a desk review approach, utilizing systematic document analysis and targeted stakeholder consultations to gather comprehensive insights on health financing for PPR. This approach ensured a robust foundation for the analysis and triangulation of findings.

3.2.1 Document analysis

A systematic review of secondary data formed the backbone of the analysis, focusing on relevant, credible, and up-to-date documents. The document review aimed to understand national priorities, resource flows, and implementation challenges in PPR. Key categories of documents included:

- National Health Sector Policies and Plans: These included strategic plans such as Zambia's NHSP 2022–2026. These documents outline medium- to long-term health priorities, including PPR objectives.
- National Budget Documents: Annual budget statements, finance acts, and medium-term expenditure frameworks (MTEF) from Zambia were analysed to understand the allocation of resources to health sectors and, specifically, to PPR.
- Expenditure Reports: End-of-year financial reports from Ministries of Health and Ministries of Finance were reviewed to assess actual expenditures against budget allocations for PPR.
- National PPR Frameworks and Emergency Response Strategies: These documents provided an understanding of each country's approach to managing pandemics and health emergencies, including plans for COVID-19, Ebola, and other emerging infectious diseases.

- Audits and Evaluation Reports: Reports from national audit offices and international agencies, such as the World Bank, WHO, and African Union, were reviewed to evaluate the efficiency and effectiveness of financial management in health and PPR sectors.

- Reports from Development Partners: Documents from stakeholders such as Africa CDC, SADC Health Community, and other international organisations were analysed to understand external contributions to PPR.

- Published and Grey Literature: Peer-reviewed journal articles, working papers, policy briefs, and research reports from academic institutions, think tanks, and government agencies were reviewed to provide additional context on PPR financing and implementation challenges.

- National Health Accounts (NHA) and WHO Global Health Expenditure Database (GHED): This data provided a detailed breakdown of spending patterns, including contributions from government and non-government sources, expenditures on PHC (PHC), and allocations to disease-specific programs.

- Ministry of Finance and National Planning (MoF)
- Zambia National Public Health Institute (ZNPHI)
- Disaster Management and Mitigation Unit (DMMU)

The consultations were systematically structured to capture qualitative data on critical issues such as resource mobilisation strategies, systemic implementation barriers, and actionable areas for improvement.

3.2.3 Triangulation and Validation

To ensure reliability, a triangulation process cross-validated findings from the document review and stakeholder inputs. This approach ensured consistency, minimised bias, and delivered evidence-based conclusions for the report

3.2.2 Stakeholder Consultations

To complement the document analysis, targeted stakeholder consultations were conducted to provide in-depth contextual and practical insights into the challenges, gaps, and opportunities in PPR financing and implementation. These consultations engaged key government stakeholders, including:

3.3 Data Analysis Techniques

3.3.1 Content review

Each document was subjected to a review to extract relevant information on PPR financing and programming. The extracted data were classified into relevant themes to facilitate analysis. First, (i) health financing levels were assessed to capture the overall level of health sector financing and the proportion specifically allocated to PPR. Second, (ii) budget allocations and programmatic priorities were analysed to identify national budgetary commitments to PPR and examine how funds are distributed across specific priorities such as surveillance, healthcare infrastructure, and laboratory systems, ensuring alignment with strategic goals. Third, (iii) expenditure trends were tracked to compare actual expenditures against budget allocations, highlighting spending patterns and any significant discrepancies.

Additionally, (iv) costs associated with pandemic responses were assessed to evaluate the financial burden of responding to pandemics, including direct and indirect costs incurred during outbreaks. Finally, (v) the review identified sources of inefficiency in resource utilisation for PPR financing and implementation. Key challenges included bureaucratic delays, fragmented governance structures, mismanagement, and systemic

3.4 Report setting

Zambia, a landlocked country in Southern Africa, shares borders with eight nations, including Tanzania, the Democratic Republic of Congo, and Zimbabwe. With a population of approximately 19 million (2023), Zambia has a youthful demographic, with over 60% under

over 60% under the age of 25 (UNDP, 2024b; World Bank, 2024). Its health system is decentralised, with the MOH providing policy direction while provincial and district offices manage service delivery. The country faces significant health challenges, including a high

3.5 Ethical Considerations

This scoping review primarily relied on secondary data sources, including national policies, budget documents, expenditure reports, and published literature on surveillance systems, PPR programs, and their financing. Additionally, stakeholder consultations were conducted with key institutional actors to provide contextual insights into the implementation, coordination, and financing of PPR in Zambia. These consultations were structured to gather institutional perspectives rather than personal data, and no human subjects were involved

As the study did not collect primary data from individuals or engage in human-subject research, ethical clearance was not required. However, all information obtained through stakeholder consultations was treated with strict confidentiality to ensure that no proprietary, sensitive, or institutionally restricted data was disclosed. Findings were reported in an aggregated and anonymised manner, aligning with best practices in ethical research.

3.6 Limitations of the report

This scoping report is subject to limitations including the following:

- **Reliance on Secondary Data Sources:** The report primarily relies on publicly available reports and institutional financial records, which may contain outdated figures or institutional biases. To enhance accuracy, data was cross validated using multiple sources, including government reports, WHO, and World Bank publications, while trend analysis was employed to minimise discrepancies.
- **Limited Granular Financial Data on PPR at the Subnational Level:** The lack of district or provincial-level financial data made it difficult to assess localised resource allocation and spending patterns. To address this, the report used national-level trends and supplemented them with qualitative insights from stakeholder consultations.
- **Limited Stakeholder Engagement:** Consultations were only held with government sector stakeholders due to time constraints, excluding frontline healthcare workers, local officials, donors, and CSOs. To address this gap, the report incorporates findings from previous assessments

4.0 Findings

4.1 Inclusion of Surveillance and PPR in Health Sector Plans

The integration of PPR into health sector plans across Zambia and other SADC countries reflects a mix of progress and persistent challenges.

Zambia has adopted a decentralised and

multi-sectoral approach to integrating PPR into its health sector strategies, focusing on strengthening surveillance, enhancing emergency response capacities, and building health system resilience. The NHSP 2022–2026 prioritises disease surveillance at national, district, and community levels, supported by investments in infrastructure, workforce development, and digital tools such as the e-IDSR. Central to these efforts is the ZNPHI, established under the ZNPHI Act No. 19 of 2020, which coordinates laboratory networks, health intelligence systems, surveillance activities, emergency preparedness, health security workforce development, and research, including managing high-risk pathogens through its Biosafety Level 3 laboratory, making it a cornerstone of Zambia's PPR efforts. (Mandyata et al., 2017; Republic of Zambia, 2023) These initiatives demonstrate a strong commitment to PPR but highlight operational challenges in full implementation across decentralised levels of governance (Mukonka, 2018; Republic of Zambia, 2023).

The OHSP 2022–2026 reinforces Zambia's multi-sectoral focus, integrating human, animal, and environmental health strategies to address zoonotic diseases, antimicrobial resistance, and broader public health risks. This framework fosters collaboration across sectors like agriculture, water, sanitation, and community development. However, fragmented coordination mechanisms and limited resource-sharing frameworks have hindered effective collaboration, reducing the efficiency of these initiatives (Republic of Zambia, 2023).

Zambia's inclusion of PPR activities within national development and financial frameworks aligns with overarching development goals and regional health strategies. However, historical underfunding of prevention and preparedness programs has constrained the full operationalisation of these plans. Evidence suggests that significant resource allocation gaps persist, particularly for laboratory networks, workforce training, and surveillance infrastructure, which require targeted investments (Republic of Zambia, 2023). Although the NHSP and OHSP address these gaps at a strategic level, operational inefficiencies such as delays in resource utilisation, weak sub-national coordination, and inadequate legislative frameworks continue to impede progress. Furthermore, while the decentralised health system prioritises rural and underserved populations, disparities in resource allocation and accessibility have yet to be adequately addressed (MOH, 2023; Republic of Zambia, 2023).

Despite these challenges, Zambia demonstrates strong alignment with global frameworks, such as the International Health Regulations (IHR) 2005, and regional collaborations, including its role as the host of the Southern Regional Coordinating Centre of the Africa CDC (Africa CDC, 2021). These efforts reflect Zambia's commitment to health security and its role as a regional leader in pandemic preparedness. While PPR is embedded within Zambia's health sector strategies at a high level, full integration remains a work in progress due to systemic inefficiencies, underfunding, and operational gaps that undermine the implementation of these strategic priorities

gaps that undermine the implementation of these strategic priorities (MOH, 2017). However, ensuring equity in resource allocation and addressing systemic inefficiencies at both national and local levels will be critical to strengthening Zambia's health system resilience (Africa CDC, 2021; WHO, 2017)

Table 1: Key Aspects of Zambia's Pandemic Preparedness and Response (PPR) Framework

Aspect	Activity
Coordination	The ZNPHI is the central coordinating body for PPR. Multi-sectoral collaboration is emphasised through frameworks like the OHSP, integrating health, agriculture, and environmental sectors (Republic of Zambia, 2023)
Community Integration	Community engagement is prioritised through decentralised health strategies. Programs emphasise grassroots participation in surveillance, risk communication, and vaccination campaigns, particularly in rural and underserved areas (Republic of Zambia, 2023)
Capacity-Building	Investments in training health workers, particularly in epidemiology and laboratory operations, aim to enhance PPR capabilities. The Field Epidemiology Training Program (FETP) and the establishment of Biosafety Level 3 laboratories are key components (Republic of Zambia, 2023)
Surveillance Systems	Zambia employs the e-IDSR system for real-time data collection and monitoring. Strengthened laboratory networks support disease intelligence and early detection (Mukonka, 2018).
Global Health Alignment	Zambia aligns with global frameworks through its role as a regional collaborator for the Africa CDC. Participation in international health agreements like the International Health Regulations (IHR) 2005 reinforces its commitment to global health security (WHO, 2017)
Emergency Preparedness	The NHSP and ZNPHI prioritise enhancing emergency response capacities, including stockpiling essential supplies, improving laboratory diagnostics, and coordinating rapid responses to outbreaks like COVID-19 and cholera (Mazaba ML, 2023)
Risk Communication	Focus on trust-building and public education through community-level campaigns. The COVID-19 response highlighted efforts to improve transparency and accountability in resource allocation and public health messaging (Mazaba ML, 2023)

Policy Goals	Key policy objectives include achieving universal health coverage, improving rural health resilience, and addressing zoonotic diseases through the One Health approach. Emphasis is placed on multi-sectoral collaboration and sustainable health system strengthening (Republic of Zambia, 2023)
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Across the SADC region, the integration of PPR into health sector plans varies significantly. South Africa, for instance, has invested in advanced laboratory infrastructure, including genomic sequencing, positioning it as a regional leader in health intelligence and pandemic preparedness (Moyo et al., 2023). Tanzania and Uganda have also adopted the One Health approach, prioritised zoonotic disease monitoring and fostered cross-sectoral collaboration (Buregyeya et al., 2020). Despite these advancements, structural inefficiencies, reliance on external funding, and fragmented governance structures hinder the scalability and sustainability of PPR initiatives. Workforce shortages, inconsistent political commitment, and disease-specific donor funding further exacerbate these challenges, leaving many countries ill-prepared for future health crises (African Development Bank Group, 2022; Hagenlocher et al, 2023)

Recent developments, such as the establishment of the Africa CDC’s Regional Collaborating Centers (RCCs), have provided a platform for SADC countries to share expertise, align strategies, and address shared vulnerabilities. For example, Zambia’s role as the host of the Southern RCC has facilitated regional training programs and joint outbreak response initiatives (Africa CDC, 2021a). Additionally, the growing threat of climate change and its impact on disease patterns, such as the spread

the growing threat of climate change and its impact on disease patterns, such as the spread of vector-borne diseases, has highlighted the need for integrated PPR frameworks that address environmental determinants of health. Addressing these gaps requires sustained domestic financing, enhanced regional collaboration, and a stronger focus on building resilient health systems capable of responding to emerging threats (UNDP, 2024b; WHO, 2023).

4.2 Integration of Surveillance and PPR financing into national budgets

The integration of PPR financing into national budgets remains a critical challenge in Zambia and across the SADC region, reflecting systemic issues in prioritisation, resource allocation, and accountability. In Zambia, PPR functions are primarily housed under the Zambia National Public Health Institute (ZNPHI), mandated by the ZNPHI Act No. 19 of 2020 to lead health security efforts, including disease surveillance, emergency preparedness, and laboratory networks. However, the absence of a dedicated budget line for government-funded PPR activities limits visibility and complicates tracking and coordination, leaving critical programs underfunded. This lack of a clear financial framework undermines the sustainability of PPR efforts, as resources are often allocated reactively rather than proactively (ZNPHI, 2023).

Funding for PPR in Zambia is highly fragmented, dispersed across various programs such as laboratory strengthening, IDSR, and emergency response initiatives. These efforts are supported by a multitude of international donors, including the World Bank, Global Fund, PEPFAR, and technical partners like the CDC and WHO. While this external support has been instrumental in addressing immediate gaps, it also highlights Zambia's heavy reliance on donor funding, which exposes the health system to vulnerabilities such as funding instability and shifts in donor priorities. For instance, ZNPHI receives less than 1% of the national health budget, with a significant portion consumed by administrative costs, leaving insufficient resources for operational and emergency response activities (African Development Bank Group, 2022; ZNPHI, 2023).

The reliance on external funding is further compounded by Zambia's limited fiscal space and substantial debt burden, which restrict the government's capacity to allocate adequate domestic resources to PPR. This over-dependence on donors creates a paradox: while external funding has strengthened PPR capacities—such as through the Zambia COVID-19 Emergency Response Project and the \$18.9 million grant from The Pandemic Fund—it also underscores the lack of a sustainable domestic financing framework. This reliance risks undermining long-term health security, as donor priorities may not always align with national needs (Pandemic Fund, 2024.; WHO., 2022)

In Zambia, the absence of a comprehensive legal and policy framework for PPR financing exacerbates these challenges. The lack of clear mandates and accountability mechanisms results in ad hoc funding arrangements that are reactive rather than proactive. Additionally, weak coordination and limited technical capacity within the MOH and ZNPHI hinder effective planning, budgeting, and monitoring of PPR activities (MOH, 2023). These systemic inefficiencies are further compounded by competing fiscal priorities, as health budgets are often directed toward immediate needs such as HIV/AIDS and maternal health, leaving little room for long-term pandemic preparedness (ZNPHI, 2024)

Despite these challenges, external support has played a critical role in enhancing Zambia's PPR capacities. Initiatives such as the Zambia Multisectoral Pandemic Preparedness and Response (ZaMPPR) Project and contributions from Irish Aid have improved IDSR capabilities and strengthened multisectoral collaboration (WHO., 2022). However, these efforts also highlight the persistent gap between donor-led programs and the need for sustainable domestic financing. The proposed NPHEF and disaster management trust fund remain unimplemented, hampered by fiscal constraints, fragmented governance, and the absence of enabling legislation (DMMU, 2025; National Assembly of Zambia, 2020).

Across the SADC region, the integration of PPR financing into national budgets is similarly uneven. While countries like South Africa and Botswana have made progress in leveraging domestic resources and aligning health emergency financing with national strategies, many others, including Zambia, continue to struggle with fragmented governance and weak institutional frameworks. A 2023 report by the Africa CDC revealed that only 30% of SADC member states have integrated PPR financing into their medium-term expenditure frameworks (MTEFs), highlighting a regional gap in sustainable health security planning (Africa CDC, 2021). This lack of harmonisation undermines collective efforts to address cross-border health threats, which require coordinated and well-resourced responses.

4.3 National Budgetary allocations to PPR

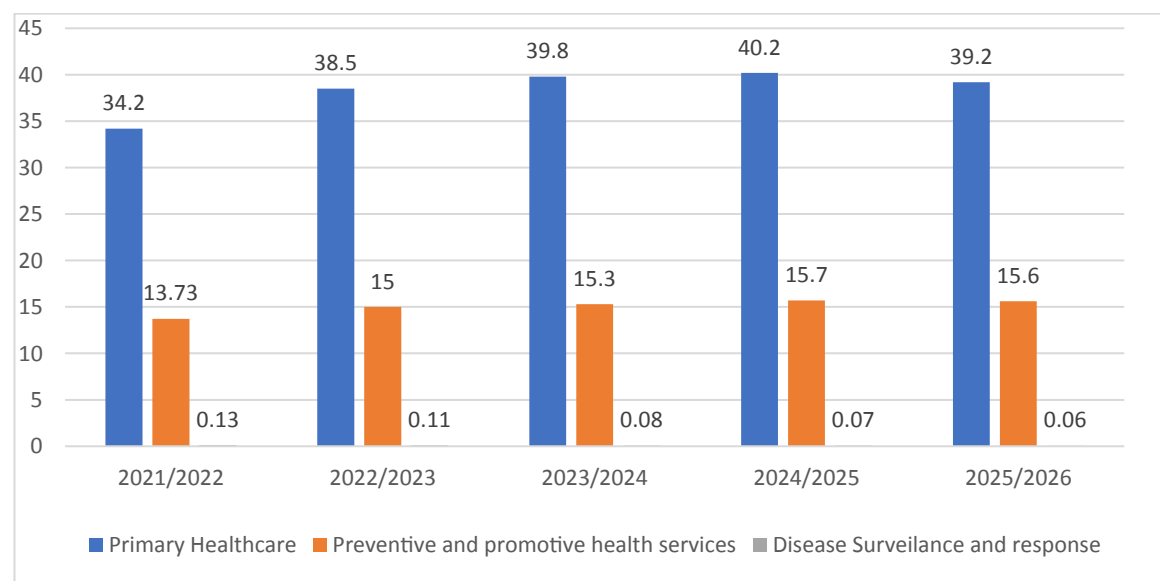
Zambia's health financing strategy, while progressive in its emphasis on PHC (PHC), reveals critical gaps in its approach to PPR. Figure 1 shows a declining trend in budgetary allocations to disease surveillance and PPR as a percentage of the total health budget, despite an overall increase in healthcare funding.

The increase in PHC allocations from ZMW 8.63 billion in 2022 to ZMW 15.86 billion in 2026 demonstrates a commitment to community-level care, including preventative measures and essential medical services (MOH, 2023).

However, the stagnation of PHC funding at around 40% of the total health budget over the past three years raises concerns about the prioritisation of preventive care. While PHC is vital, the persistent underfunding of disease surveillance and

surveillance and PPR—allocations for which have declined from ZMW 32.36 million (0.13%) in 2022 to ZMW 24.88 million (0.06%) in 2026—exposes a glaring oversight in Zambia's health financing priorities (ZNPHI, 2023). This underfunding severely hampers the ZNPHI leaving the country ill-prepared to detect, monitor, and respond to public health emergencies. The COVID-19 pandemic starkly highlighted these vulnerabilities, as weak surveillance systems and delayed responses exacerbated the crisis (Mazaba ML, 2023). Zambia's health financing model heavily prioritises curative services and PHC, while investments in PPR remain limited. This imbalance reflects systemic constraints in resource allocation, which, despite strengthening routine healthcare delivery, leaves critical gaps in the country's ability to anticipate, detect, and effectively respond to emerging health threats.

Figure 1: Allocations to Preventive and Promotive Health Services, and Disease Surveillance and Response as a % of the Total Health Budget in Zambia



Source: *Constructed from Budgets*

This trend is not unique to Zambia but is emblematic of a regional challenge within the SADC. Across SADC member states, health budgets disproportionately favor curative services, while disease surveillance and PPR remain grossly underfunded (SADC, 2021). For instance, South Africa, despite its relatively advanced healthcare system in the region, faced significant challenges during the COVID-19 pandemic, prompting the establishment of the Solidarity Fund to mobilise domestic resources for emergency response (Public Service Commission, 2022). While this initiative demonstrated the potential of innovative financing mechanisms, it also underscored the region’s reliance on reactive rather than proactive measures. Similarly, countries like Zimbabwe and Malawi continue to depend heavily on external donors for health system strengthening, with insufficient domestic allocations exacerbating existing vulnerabilities (Mhazo et al., 2024; Sharma et al., 2024) . Botswana, on the other hand, has taken a more integrated approach by

embedding health emergency financing within its Ministry of Finance, ensuring alignment with national priorities (Republic of Botswana, 2021). This model, though promising, has yet to be widely adopted across the region, leaving SADC countries collectively vulnerable to health emergencies

Beyond SADC, other African countries face similar challenges, albeit with varying degrees of success in addressing them. Nigeria, for example, has struggled with chronic underfunding of its health sector, with less than 5% of its national budget allocated to health, far below the 15% target set by the Abuja Declaration (Olaniyi, 2023; WHO, 2021).

In contrast, Rwanda has emerged as a regional leader in health financing, leveraging community-based health insurance schemes and robust domestic resource mobilisation to achieve significant improvements in health outcomes (World Bank, 2022). However, even Rwanda's successes are tempered by the persistent threat of underfunded disease surveillance systems, which remain a weak link in its otherwise resilient health system. Africa CDC has sought to address these gaps by promoting regional collaboration and capacity-building for disease surveillance and response. Yet, without sustained domestic investment in PPR, these efforts risk being undermined by systemic underfunding at the national level.

4.4 Level and sources of Health Expenditure on PPR

The level and sources of health expenditure on PPR in Zambia reveal a complex financing landscape characterised by heavy reliance on external funding, limited domestic contributions, and systemic inefficiencies in resource allocation. This dependency mirrors broader trends across Sub-Saharan Africa, where 60% of health security funding originates from international donors, leaving countries vulnerable to shifting global priorities (WHO AFRO., 2023). Table 2 provides a detailed breakdown of ZNPHI's spending on epidemiological surveillance and risk and disease control programs for 2022 and 2023, highlighting key trends and challenges in health financing

Figure 1: Allocations to Preventive and Promotive Health Services, and Disease Surveillance and Response as a % of the Total Health Budget in Zambia

Source	2022		2023	
	Amount	%	Amount	%
GRZ Grant	13,252,524	78%	13,252,524	46%
Foreign Donor Fund	3,580,667	21%	15,274,948	53%
Other Receipt (includes Local)	135,398	1%	362,567	1%
Total	16,968,589	100%	28,890,039	100%

Source: ZNPHI Annual Report 2023

In 2022, total funding for epidemiological surveillance and disease control programs was K16.97 million. GRZ contributed K13.25 million, accounting for 78% of the total funding, while foreign donor contributions dropped significantly to K3.58 million, representing just 21%. The remaining 1% (K135,398) came from "Other Receipts," reflecting minimal contributions from local or private sources. In 2023, total funding

private sources. In 2023, total funding increased sharply to K28.89 million, driven by a substantial rise in foreign donor support to K15.27 million (53% of total funding). However, GRZ's nominal contribution remained stagnant at K13.25 million, reducing its share of the total funding to 46%. Contributions from "Other Receipts" also increased marginally to K362,567, maintaining their 1% share.

The sharp increase in donor funding underscores the volatility and uncertainty of external support and its impact on program sustainability. Donor fatigue, particularly during prolonged emergencies or when outcomes are not immediately visible, has exacerbated this challenge. External funding is often tied to specific projects or short-term objectives, leaving critical programs vulnerable to disruptions. For instance, volatility in donor contributions as evidenced between 2022 to 2023 has left Zambia's PPR programs underfunded, compromising the country's ability to detect and respond to public health threats. This challenge has been further exacerbated by the recent 2025 U.S. foreign aid freeze under the Trump administration, which has halted USAID-funded health programs across Africa, including key disease surveillance and pandemic preparedness efforts in Zambia (Imray et al., 2025). Additionally, the U.S. withdrawal from the WHO has reduced global funding streams, placing even greater pressure on Zambia's already fragile health security financing framework (Kyobutungi, 2025). PEPFAR, which has played a crucial role in strengthening health systems and averting pandemics by supporting HIV/AIDS treatment and surveillance, now faces funding uncertainty, raising concerns about the potential resurgence of infectious diseases in Zambia and across the region (Imray et al., 2025). This overreliance on external funding highlights the urgent need for Zambia to diversify its funding sources and increase domestic investments in health security (Shinners, 2024; ZNPHI, 2023).

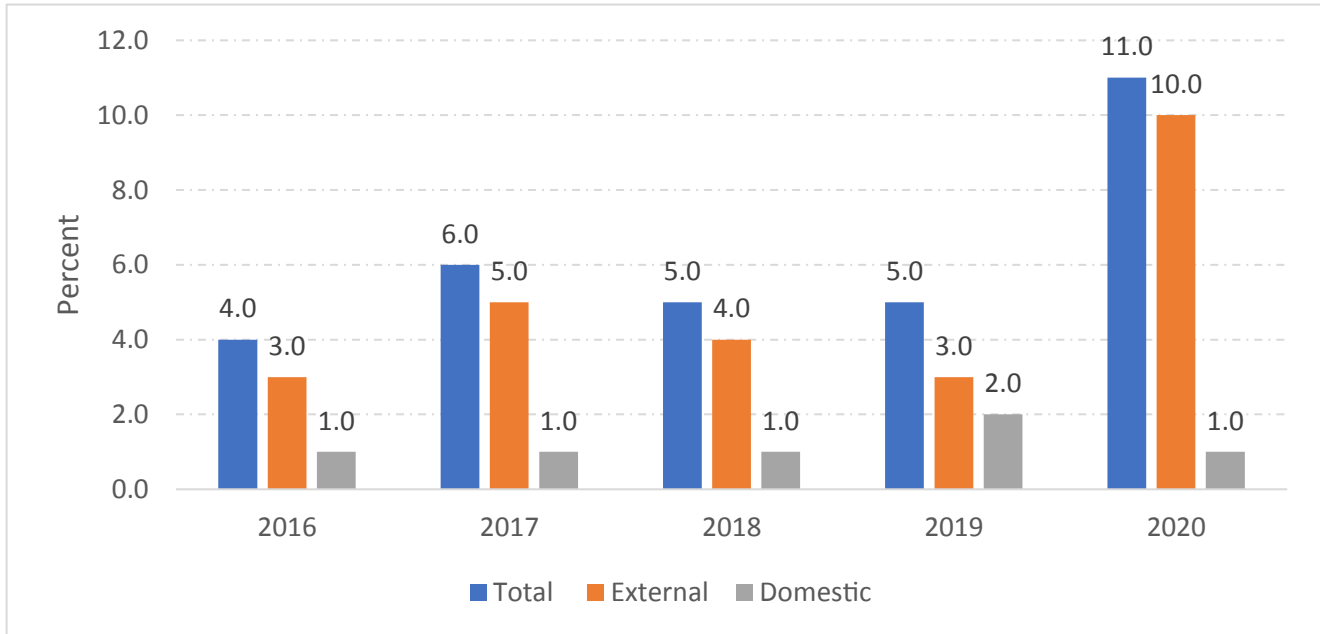
Despite GRZ's consistent contribution of ZMW13.25 million in both years, concerns have been raised about the misallocation of these

have been raised about the misallocation of these funds. A significant portion of GRZ's contributions is often directed toward administrative expenses, such as office rentals, rather than critical operational or strategic activities (ZNPHI, 2023). This misallocation limits the effectiveness of surveillance programs and undermines efforts to build resilient health systems. For example, while GRZ's funding has remained stagnant, there has been limited investment in essential areas such as laboratory infrastructure, workforce training, and community-based surveillance (ZNPHI, 2023). This inefficiency is compounded by fragmented governance structures and a lack of transparency in resource allocation, further hindering the effective implementation of preparedness programs (ZNPHI, 2023).

Efforts to address these challenges have yielded limited progress. The COVID-19 bond, launched in 2020, raised ZMW2.5 billion domestically but faced criticism for opaque fund management and exclusion of grassroots stakeholders in decision-making (Policy Monitoring and Research Centre (PMRC), 2020; World Bank, 2021). Additionally, proposals to establish a NPHEF and a Disaster Management Fund, alongside initiatives to involve Members of Parliament (MPs) in health financing discussions, underscore a growing commitment to developing sustainable funding solutions (AFIDEP, 2024). However, the implementation of these mechanisms has been slow, hampered by limited fiscal space, competing government priorities, and weak institutional frameworks. The lack of progress in establishing these funds highlights systemic barriers that must be addressed to ensure long-term financial stability for health security programs (DMMU, 2017).

In the SADC region, spending on epidemiological surveillance and risk and disease control programs, as a proportion of Current Health Expenditure (CHE), increased significantly from 4% in 2016 to approximately 11% in 2020. This growth reflects heightened global awareness and financial support for PPR, particularly following the outbreak of COVID-19 in 2019 and 2020 (WHO, 2021). Figure 1 illustrates this trend, emphasizing the critical role of international donor efforts in strengthening health systems during the crisis.

Figure 2: Expenditure on Epidemiological surveillance and risk and disease control programmes % Current health expenditure (CHE) in SADC region



Source: Compiled from WHO global health expenditure database

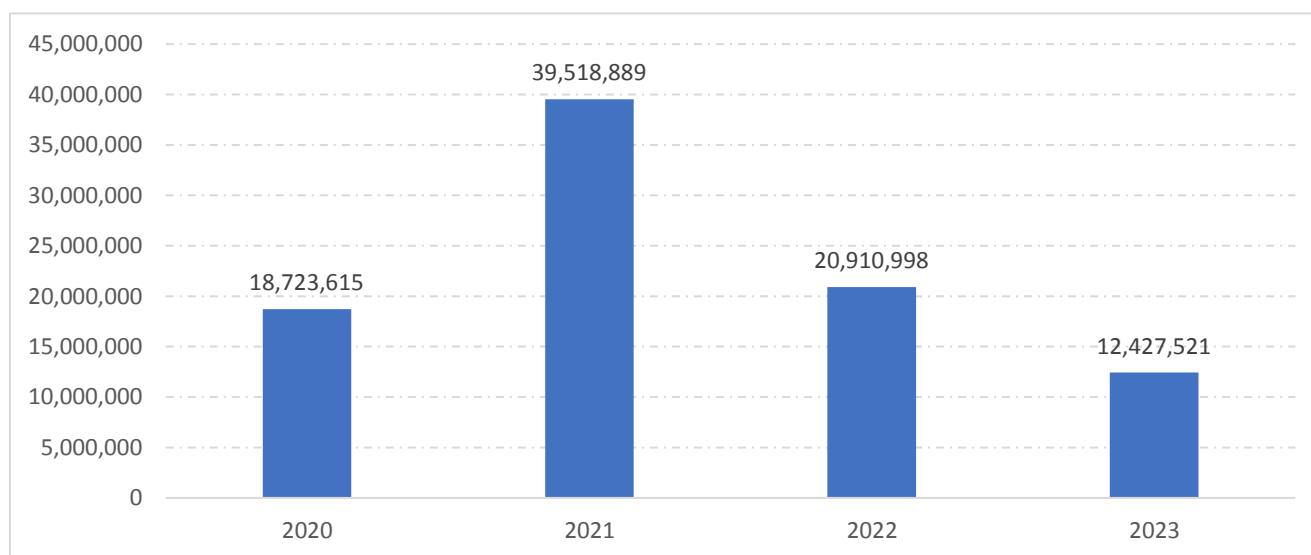
The inherent variability of external funding, influenced by geopolitical factors such as shifting donor priorities, global economic downturns, and competition for resources due to concurrent crises (e.g., conflicts, climate-related disasters, and global pandemics), makes it challenging for countries to plan and invest in long-term health infrastructure and preparedness programs.

1.1.1 Trends in external pandemic Financing

The previous section highlights a heavy reliance on external financing at both regional and country levels. The dependence on external versus domestic funding in each country or region exposes potential vulnerabilities. A high reliance on external funding can undermine long-term sustainability and responsiveness, particularly when such funding is tied to global health agendas rather than local needs. Zambia, for instance, received only 0.3% of global Development Assistance for Health (DAH) for COVID-19, despite being among the top 20 countries most vulnerable to pandemics due to high HIV/TB coinfection rates and climate-induced disease spread (Notre Dame Global Adaptation Initiative (ND-GAIN), 2023). This inequity underscores the limitations of donor-driven health security frameworks, which often prioritise geopolitical interests over need-based allocation.

Figure 3 illustrates the scale of pandemic financing, using the COVID-19 pandemic as a case study, and primarily examines development assistance for health (DAH) with a focus on pandemic-related funding. We draw on data from the Institute for Health Metrics and Evaluation (IHME)'s Development Assistance for Health on COVID-19 Database (2020–2023) to assess total resources allocated

Figure 3: Global Development assistance for health (COVID-19) during the pandemic, 2020–2023 (000, USD)



Source: Constructed using IHME's Development Assistance for Health on COVID-19 Database 2020–2023

Between 2020 and 2023, a total of \$91.5 billion in development assistance was allocated to health initiatives for COVID-19. Annual contributions fluctuated, peaking in 2021 at \$39.5 billion, coinciding with intensified global response efforts at the height of the pandemic, including vaccine distribution and support for healthcare systems. However, a notable decline in funding observed in 2022 and 2023 suggests a transition towards long-term recovery initiatives, which appear inadequate to meet ongoing needs.

This significant decrease in DAH post-peak COVID-19 further emphasises the need for increased domestic allocations for PPR, ensuring that countries can sustain PPR independently of fluctuating donor priorities. In Zambia's case, the disproportionately low share of global DAH highlights structural inequities in global health financing, reinforcing the necessity for stronger domestic resource mobilisation and innovative financing strategies to enhance PPR.

4.5 Financing Gaps and needs for implementation

Zambia faces critical challenges in funding their health systems, particularly in the areas of PPR. The country allocates less than the 15% target set by the Abuja Declaration for health spending, leaving significant gaps in critical health system capacities. This section examines their respective funding landscapes and highlights key deficiencies

Zambia, relies on a mix of domestic and international funding for its health sector, allocating 9–10% of its national budget to healthcare which falls short of the Abuja Declaration target (MOH, 2023). Donor funding in Zambia is also concentrated on specific diseases, such as HIV/AIDS, tuberculosis, and malaria, leaving PPR funding fragmented and inadequate. Annual PPR funding is estimated at \$35–50 million, which is insufficient for comprehensive preparedness (GHSI, 2021).

Zambia's gaps in disease surveillance are notable, with laboratory capacity requiring \$10–15 million for upgrades (Africa CDC, 2021). Workforce development faces a \$5–8 million shortfall, hindering efforts to build capacity and train personnel (Gostin et al., 2016). Emergency preparedness, which includes maintaining stockpiles of critical supplies, requires an additional \$4–6 million annually (Gavi, 2023). Public health communication campaigns and governance mechanisms are similarly underfunded, with gaps of \$1–2 million and \$1–3 million, respectively (Ghafur et al., 2021; Africa CDC, 2021). Zambia's total funding shortfall for a comprehensive PPR program is estimated at

\$25–35 million for initial investments and \$15–20 million annually for recurrent costs (WHO, 2021; World Bank, 2021).

Table 3 summarises the funding allocations and gaps for Zambia. The data highlights the systemic challenges the country faces in achieving robust and sustainable PPR systems. Without targeted investments in surveillance infrastructure, workforce development, emergency preparedness, and governance mechanisms, Zambia remains vulnerable to future health crises.

Table 3: Health Funding and Preparedness Gaps in Zambia

Category	Specification
Health Budget Allocation	9–10% of national budget (below 15% target) (MOH, 2023)
Annual PPR Funding	\$35–50 million (Global Health Security Index (GHSI), 2021)
Donor Funding Focus	Disease-specific initiatives (e.g., HIV/AIDS, TB, malaria) (World Bank, 2021)
Surveillance Systems	Limited, donor-dependent, with gaps in regions (GHSI, 2021)
Surveillance Infrastructure Gap	\$10–15 million for lab upgrades (Africa CDC, 2021)
Workforce Development Gap	\$5–8 million for workforce capacity-building (Gostin et al., 2016).

Emergency Preparedness Gap	\$4–6 million for stockpiling supplies (Gavi, 2023).
Public Health Communication Gap	\$1–2 million for campaigns (Ghafur et al., 2021).
R&D Gap	Not specified, but limited investment (Piot et al., 2019).
Coordination and Governance Gap	\$1–3 million for strengthening governance (Africa CDC, 2021).
Total Initial Funding Gap	\$25–35 million (WHO., 2021).
Total Annual Funding Gap	\$15–20 million (World Bank, 2021)

The COVID-19 pandemic revealed critical weaknesses in the health infrastructures of many African countries, including insufficient funding and poorly aligned aid allocations. These deficiencies hindered effective responses to the pandemic and underscored the urgent need for sustained investment in PPR programs. Despite increased global recognition of these issues, significant financing gaps persist, limiting the effective implementation of critical initiatives (WHO et al., 2022b).

Table 4 outlines the total annual financing requirements for PPR across low-, lower-middle- and upper-middle-income countries, estimated at \$26.4 billion. Surveillance, collaborative intelligence, and early warning systems constitute the largest component, requiring \$12.2 billion annually—nearly half of the total estimated needs.

Public health and social measures to engage and build resilient communities account for \$4.8 billion, while lifesaving interventions and scalable health systems require \$5.4 billion annually. These figures demonstrate the critical importance of robust surveillance and early warning systems, alongside community engagement, to mitigate public health threats effectively

Table 4: National level financing requirements of the PPR by income group (in US\$ billion)

PPR framework subsystems	Estimated national-level priority needs (US\$ billion)			
	LIC	LMIC	UMIC	Total
<i>Surveillance, collaborative intelligence and early warning</i>	1.3	6.2	4.7	12.2
<i>Prioritised research and equitable access to medical countermeasures and essential supplies</i>	0.2	1.0	0.8	2.0
<i>Public health and social measures and engaged, resilient communities</i>	0.5	2.5	1.8	4.8
<i>Lifesaving, safe and scalable health interventions and resilient health systems</i>	0.5	2.8	2.1	5.4
<i>PPR strategy, coordination and emergency operations</i>	0.2	1.0	0.8	2.0
Total	2.7	13.5	10.2	26.4

Source: Compiled by the World Bank based on publicly available data from National Action Plans for Health Security framework of WHO.

Despite the outlined requirements, domestic financing for PPR remains inadequate. Table 5 illustrates significant disparities in PPR spending per capita across income groups. In LICs, domestic health spending averages \$10.2 per capita annually, with PPR allocations representing only \$0.1–\$0.3 per capita. Even in LMICs, PPR allocations remain modest at \$0.4–\$1.1 per capita. This chronic underinvestment reflects systemic challenges such as limited fiscal space and competing health priorities. The lack of adequate funding poses severe risks, as insufficient investment in PPR leaves countries unprepared to respond effectively to public health emergencies

Table 3: Health Funding and Preparedness Gaps in Zambia

Income group	Dom. govt. exp. on health (US\$ per capita)	Domestic PPR spending per capita in US\$	
		1% of dom. health exp.	3% of dom. health exp.
Low income	10.2	0.1	0.3
Lower middle income	35.4	0.4	1.1
Upper middle income	296.8	3.0	8.9
High income	3486.4	34.9	104.6

Source: Source: Compiled by the World Bank based on publicly available data from National Action Plans for Health Security framework of WHO

Table 6 shows the minimum and maximum shortfalls in PPR funding, which range from \$9.3 billion (minimum) to \$7.0 billion (maximum). Surveillance, collaborative intelligence, and early warning systems account for the largest share of the shortfall (\$4.3 billion at 1% allocation), underscoring critical underfunding in essential public health functions.

Table 6: International financing gap for national needs

PPR framework subsystems	Estimated national level priority needs (US\$ billion)	Minimum priority gaps assuming 1% spend on PPR (US\$ billion)	Minimum priority gaps assuming 3% spend on PPR (US\$ billion)
<i>Surveillance, collaborative intelligence and early warning</i>	12.2	4.3	3.2
<i>Prioritised research and equitable access to medical countermeasures and essential supplies</i>	2.0	0.7	0.5
<i>Public health and social measures and engaged, resilient communities</i>	4.8	1.7	1.2
<i>Lifesaving, safe and scalable health interventions and resilient health systems</i>	5.4	1.9	1.4
<i>PPR strategy, coordination and emergency operations</i>	2.0	0.7	0.5
Total	26.4	9.3	7.0

Source: Estimates by the WHO et al., (2022)

The World Health Organisation and World Bank (2022) emphasises the importance of increasing both domestic and international funding for core PPR functions to bridge the identified gaps. It also stresses the need to leverage resources allocated for strengthening health systems and disease control programs to enhance PPR. An example of leveraging resources for PPR is the Global Fund's substantial investments in surveillance and laboratory capacity through its support of malaria, HIV, and tuberculosis programs

stability and rapid response in PPR, yet Zambia lacks a dedicated and structured pooling mechanism. Zambia's fragmented approach to financing PPR is a significant barrier to effective health security.

4.6 Resource pooling and financing mechanisms for PPR

Resource pooling is critical for ensuring financial

. The lack of a dedicated pooled funding mechanism means that financial resources for surveillance and emergency response are spread across multiple institutions, including the MOH, the ZNPHI, and the DMMU. This fragmentation complicates fund allocation and tracking, making it difficult to ensure that resources are directed towards prevention and preparedness rather than just emergency response (World Bank, 2020b). Despite the ZNPHI Act No. 19 of 2020 providing for the establishment of a National Public Health Emergency Fund, this fund is yet to be operationalised, hindering proactive investments in PPR (ZNPHI Act, 2020).

Zambia's reliance on external funding for PPR is another critical issue. Over 80% of PPR financing comes from external sources such as the Global Fund, WHO, Africa CDC, World Bank, and USAID (MOH, 2021). This donor-driven financing model introduces financial volatility, as resources are often tied to donor priorities rather than Zambia's strategic needs. For example, during the COVID-19 pandemic, Zambia faced delays in accessing funds from the Global Fund due to bureaucratic hurdles, which slowed the country's response efforts (Global Fund, 2021). The absence of pre-arranged risk-sharing mechanisms and performance-based financing models further exacerbates the problem, leaving the health system vulnerable to delayed funding disbursements and ineffective allocation of resources (WHO, 2021).

Domestic resource mobilisation for PPR is also limited. Zambia's health insurance mechanisms, such as the National Health Insurance Scheme (NHIS), do not include provisions for pandemic

preparedness or emergency response (NHI Act, 2018). While the Bank of Zambia's COVID-19 bond provided emergency funds during the pandemic, such mechanisms have not been institutionalised for future preparedness efforts (BoZ, 2020). Without a formalised financial pooling system, Zambia continues to face challenges in mobilizing, disbursing, and sustaining resources for PPR financing, weakening its overall health security framework.

The SADC faces similar challenges in PPR financing. Resource pooling for PPR remains limited and fragmented across the region, with most countries relying heavily on external funding for preparedness and response activities (SADC Secretariat, 2021). While some nations, such as Mauritius and Seychelles, have established dedicated contingency funds for health emergencies, most SADC countries lack structured financial pooling mechanisms for disease surveillance, laboratory infrastructure, and rapid response efforts (African Union, 2020). This gap significantly weakens regional health security, as financial mobilisation for emergencies remains ad hoc and unpredictable.

Moreover, the 2025 U.S. withdrawal from the WHO has further constrained the availability of global pooled funding streams, reducing financial contributions to WHO-led and Africa CDC-supported emergency financing mechanisms, which many SADC countries, including Zambia, depend on (Kyobutungi, 2025). This reduction in global support has reinforced the urgency of developing structured domestic and regional financing alternatives to reduce reliance on politically volatile donor aid.

The SADC Pooled Procurement Services (SPPS) aims to improve access to medical supplies and vaccines by enabling joint purchasing among member states. However, inconsistent contributions and weak coordination have limited its impact, reducing the effectiveness of collective bargaining in securing critical PPR resources (SADC, 2021). Additionally, while initiatives such as Africa CDC's Pandemic Fund and the World Bank's Catastrophe Deferred Drawdown Option (Cat DDO) provide financial support for regional preparedness, bureaucratic delays and donor restrictions hinder the rapid deployment of funds to where they are most needed (World Bank, 2020a).

A key challenge in the SADC region is the absence of sustainable domestic financing mechanisms for PPR. Unlike countries such as South Africa, which successfully mobilised domestic private-sector contributions through its Solidarity Fund during COVID-19, most SADC nations lack frameworks for engaging private and non-state actors in health security financing (Solidarity Fund, 2022). Without structured domestic resource pooling, countries remain financially dependent on external aid, increasing their vulnerability to health crises and donor funding fluctuations.

Regional insurance mechanisms such as the African Risk Capacity (ARC) provide financial coverage for disasters but do not comprehensively address public health emergencies, creating a gap in risk financing for pandemics (ARC, 2021). Countries such as Botswana and Namibia, which have stronger domestic revenue bases, have taken steps to establish multi-sectoral emergency funds, but

these efforts remain isolated rather than regionally coordinated (SADC Secretariat, 2021). The absence of a harmonised regional fund for PPR means that SADC countries struggle to mobilise collective financial resources for large-scale health emergencies, delaying responses and increasing reliance on external partners.

4.7 Constraints in implementing PPR Programs

Zambia has made significant strides in developing strategies and plans for PPR. However, the implementation of these plans is hindered by a multitude of challenges that undermine their effectiveness. These challenges can be categorised into five main areas:

logistical challenges, inadequate data systems, capacity constraints, fragmented coordination, and limited political commitments.

Logistical Challenges: Zambia's logistical infrastructure is a significant barrier to the effective implementation of PPR programs. The country's underdeveloped road networks, particularly in rural areas, make it difficult to transport essential health materials such as vaccines, medical supplies, and emergency relief items. For instance, delays in vaccine delivery to remote regions have been documented, leading to gaps in immunisation coverage and disease management efforts (Gitonga et al., 2020). These logistical barriers not only jeopardise the success of PPR programs but also undermine broader public health goals, such as disease eradication.

Moreover, the distribution of emergency storage facilities across the country is highly uneven, with significant disparities between regions. Many areas lack adequate infrastructure to meet the growing demands during emergencies. Although new facilities are being constructed each year, the pace of development remains sluggish, failing to keep up with the increasing needs of the population and disasters (DMMU, 2025). Additionally, the absence of Public Health Emergency

Emergency Operations Centers (PHEOCs) at provincial and district levels further limits the capacity to coordinate and respond to emergencies effectively. This glaring gap underscores the urgent need for a substantial expansion of infrastructure to ensure comprehensive coverage and preparedness across all administrative levels

In furtherance, the lack of reliable transportation systems also increases the cost of program implementation, diverting resources that could otherwise be used to expand coverage or improve service delivery. Strengthening supply chains, increasing stockpiles, and improving distribution networks are essential steps to ensure timely and adequate support during emergencies (DMMU, 2025).

Inadequate Data Systems: Despite advancements in technology for public health surveillance, Zambia's health information systems continue to face challenges that hinder effective disease monitoring and PPR planning. Accurate and timely data are critical for identifying and mitigating health threats; however, weak data systems characterised by low accuracy and a lack of real-time reporting mechanisms result in inconsistent data collection.

These inefficiencies hamper decision-making and delay responses to emerging health crises. For example, during the COVID-19 pandemic, gaps in data collection and analysis delayed the identification of hotspots, preventing timely interventions (FAO, 2022).

Addressing these challenges requires the implementation of advanced surveillance systems that not only collect data efficiently but also ensure its accuracy and usability in real time.

To enhance disease surveillance, several technological tools have been integrated to improve data management and public health response. The Health Management Information System (HMIS) operates at both the ministry and facility levels, streamlining data collection and management, which facilitates more effective tracking and analysis. (ZNPHI, 2024). Additionally, the SEBRA (Zambia Emergency Bridge for Response Application) System enhances surveillance by linking laboratory data with epidemiological information, providing a comprehensive overview of disease patterns and informing targeted interventions. Furthermore, the EBS System plays a critical role in real-time detection of public health threats through mobile-based signal tracking, enabling rapid identification and response. While these systems significantly strengthen disease monitoring, more efforts are needed to optimise data integration, enhance real-time reporting, and ensure that surveillance mechanisms are robust enough to support proactive health interventions (ZNPHI, 2024).

Technological gaps further weaken the overall effectiveness of emergency response efforts. The National Emergency Operations Center lacks robust communication and early warning systems, hindering the timely dissemination of critical information and coordination among response teams.

Additionally, the limited access to advanced technologies, such as satellite-based communication systems, creates barriers to effective field operations, particularly in remote or hard-to-reach areas. The absence of real-time surveillance systems at all administrative levels—community, district, provincial, and national—further delays the early detection and response to public health threats (DMMU, 2025; ZNPHI, 2024).

Without reliable data, it becomes challenging to monitor the progress of PPR programs, allocate resources efficiently, and measure their impact. Strengthening data systems and investing in modern technology and integrated surveillance systems are therefore essential for improving the effectiveness of PPR initiatives and ensuring that pandemics are adequately managed.

Capacity Constraints: Capacity constraints, particularly the shortage of skilled personnel and limited access to essential equipment, further hinder the implementation of PPR programs in Zambia. The country faces a severe shortage of healthcare workers trained in disease surveillance and control. This shortage is particularly acute in rural areas, where the need for such expertise is greatest (FAO, 2022)

The shortage of specialised personnel in critical fields such as field epidemiology, laboratory experts, and public health informatics is a pressing concern at both national and district levels. While efforts are being made to address these gaps through structural expansions and targeted training

programs, the retention of trained professionals remains a significant challenge. Limited mechanisms for ensuring long-term service, coupled with inadequate incentives and career development opportunities, contribute to high turnover rates. This persistent issue undermines the sustainability of workforce capacity and hampers the ability to maintain a robust emergency response system (ZNPHI, 2024). Additionally, the limited availability of diagnostic tools and other medical equipment hampers the ability of healthcare workers to detect and respond to disease outbreaks promptly. Capacity constraints not only delay disease reporting and response but also reduce the overall effectiveness of PPR programs.

Fragmented Coordination: Effective implementation of PPR programs requires close collaboration among various stakeholders, including government ministries, local health agencies, non-governmental organisations, and international partners. However, coordination among these entities in Zambia is often fragmented, leading to uncoordinated and inefficient responses to health emergencies. For example, during the COVID-19 pandemic, poor communication and collaboration between the MoH and other government departments resulted in delays in implementing coordinated interventions (World Bank, 2020b).

In furtherance, mobilizing response teams and securing emergency funds are often hindered by bureaucratic delays and resource constraints. Gaps in coordination are particularly evident during the planning and implementation of outbreak responses, where fragmented efforts can lead to inefficiencies and missed

opportunities for intervention. While collaborative frameworks like the National Health Security Action Plan (NHSAP) have been established with support from partners, bottlenecks in securing timely funding and resources continue to limit the effectiveness of these initiatives (DMMU, 2025; ZNPHI, 2024).

Strengthening institutional mechanisms for coordination, streamlining funding processes, and fostering partnerships are critical to overcoming these challenges and ensuring a cohesive and efficient emergency response system.

Limited Political Commitment: Sustained political commitment is essential for the successful implementation of PPR programs, as it ensures the prioritisation and allocation of adequate resources to health and poverty reduction initiatives. However, Zambia's political landscape is often characterised by instability and shifting priorities, which undermine long-term planning and funding for PPR programs. For instance, changes in government leadership have led to fluctuations in budget allocations for health and poverty reduction, disrupting the continuity of critical programs (Stiftung, 2024).

Without consistent political support, PPR initiatives are often underfunded and poorly executed, limiting their impact on poverty alleviation and public health outcomes. Addressing this issue requires a commitment to depoliticizing health and poverty reduction efforts and ensuring that they remain a priority regardless of changes in government.

Table 7 below summarises key constraints affecting the implementation of PPR programs in Zambia. These barriers span logistical challenges, inadequacies in data systems, capacity limitations, fragmented coordination, and insufficient political commitment. Each of these factors not only hampers program execution but also diminishes the resilience of health systems to respond effectively to public health emergencies.

Table 7: Constraints in Implementing PPR Programs in Zambia

Constraint	Details	Examples
Logistical Challenges	Poor infrastructure and supply chain systems delay the delivery of health resources.	In Zambia, transportation challenges slowed the distribution of medical supplies to remote areas (Gitonga et al., 2020).
Inadequate Data Systems	Surveillance systems suffer from poor data accuracy and lack real-time reporting.	In Zambia experience inconsistent data reporting and underdeveloped health information systems, hindering disease monitoring and decision-making (FAO, 2022).
Capacity Constraints	Insufficient trained personnel and equipment undermine PPR efforts.	In Zambia, a shortage of trained personnel and tools delays disease reporting and response (FAO, 2022).
Fragmented Coordination	Weak collaboration among health agencies causes disjointed responses to health emergencies.	In Zambia, poor communication among ministries slowed COVID-19 response efforts (World Bank, 2020b).
Limited Political Commitment	Lack of sustained government support undermines the prioritisation of health initiatives.	In Zambia, political instability and shifting priorities disrupt funding and continuity of surveillance programs (Stiftung, 2024).

While these challenges are particularly pressing in Zambia, they are not unique to the country. Many SADC member states face similar structural and systemic barriers that weaken their PPR capacity. Addressing these challenges requires a coordinated regional approach, as public health threats, including pandemics, do not respect national borders.

Logistical Challenges in PPR for SADC Nations:

The logistical hurdles faced by many SADC nations in establishing robust monitoring and PPR initiatives are both complex and multifaceted. Poor infrastructure, such as inadequate road networks, limited access to reliable transportation, and fragmented supply chain systems, often results in significant delays in the delivery of critical medical resources.

These challenges are particularly pronounced in remote and rural areas, where healthcare access is already limited. For instance, in Zambia, transportation bottlenecks have repeatedly disrupted the distribution of essential medical supplies, leaving vulnerable populations—such as those in hard-to-reach regions—without timely access to healthcare services (Gitonga et al., 2020). Such delays not only exacerbate health crises but also undermine the region's overall preparedness and ability to respond effectively to emerging health threats

SADC's logistical challenges extend beyond health issues to its peacekeeping missions, where the lack of a regional logistics depot has hindered the ability to deploy and sustain operations. For example, delays in the delivery of critical supplies and equipment have caused vulnerabilities in peacekeeping missions like SADC Mission in Mozambique which had to rely on the AU's base in Cameroon and limited airlift capabilities. SADC Mission in the Democratic Republic of Congo faced similar delays, risking the safety of peacekeepers and mission success. This lack of centralisation has highlighted the need for more efficient logistical infrastructure to support both health and security responses (Dzinesa, 2025).

To address these logistical barriers, targeted investments in infrastructure development are essential. Improving road networks, expanding cold chain storage facilities, and leveraging innovative solutions like drone technology for last-mile delivery of medical supplies are crucial steps. Additionally, SADC is working on establishing a regional logistics depot in Botswana, set to be completed by 2030. This

depot will centralise storage, maintenance, and medical supplies, ensuring a "just-in-time" resource delivery system that improves the efficiency and effectiveness of both health and peacekeeping operations. This infrastructure improvement will enhance the region's preparedness and response capabilities for health emergencies, ensuring timely and coordinated resource deployment (Dzinesa, 2025; Gitonga et al., 2020).

Inadequate Data Systems: Inadequate data systems in the SADC present a critical gap in both health surveillance and patient tracking, undermining the region's ability to respond effectively to health crises. The underdeveloped health information infrastructure often relies on outdated or incomplete data, limiting timely decision-making and response efforts. Irregular reporting and fragmented data collection further exacerbate these issues. For example, Zambia has faced challenges in integrating disease monitoring systems across regions, leading to delays in outbreak detection and response (FAO, 2022). Additionally, in high HIV-prevalence countries, population mobility complicates patient tracking and care linkage. A landscape analysis of case-based surveillance (CBS) and unique patient identifiers (UPI) revealed significant gaps, with existing patient identification methods often unreliable, paper-based, and poorly integrated. As seen in a South African case study, the UPI was frequently uncaptured, hindering effective patient tracking across prevention and care cascades. Strengthening health data systems in SADC, through the adoption of digital health technologies, interoperable platforms, and capacity-building, is critical to improving both

disease surveillance and patient care linkage, enabling faster, more accurate responses to health emergencies (Govender et al., 2023).

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Capacity Constraints: The effectiveness of SADC's monitoring and PPR initiatives is significantly hindered by chronic capacity constraints, including a severe shortage of skilled healthcare professionals and

essential equipment. In countries like Zambia, the lack of adequately trained healthcare workers and insufficient diagnostic tools have delayed timely disease detection and response efforts, placing immense strain on existing healthcare systems, particularly during health crises (FAO, 2022). These capacity gaps are further exacerbated by the SADC region's substantial deficit in healthcare professionals. The Health Workforce Strategic Plan 2020–2030 suggests that while existing training capacities could meet only 66% of the projected demand for healthcare workers by 2030, underinvestment and budget constraints are expected to fund only 33% of the required positions, intensifying the shortage of qualified personnel (SADC, 2021). To address these challenges, urgent investments in workforce development, such as training programs for healthcare workers and procurement of essential medical equipment, are needed. Furthermore, regional collaboration to share resources and expertise could alleviate capacity constraints, improving the overall effectiveness of health initiatives and strengthening the region's ability to respond to health emergencies.

Fragmented Coordination: Inadequate collaboration among government agencies, health ministries, and international organisations remains a significant barrier to effective health emergency responses in the SADC region. Fragmented coordination often leads to disjointed efforts, duplication of activities, and delays in implementing critical measures

during the COVID-19 pandemic, Zambia faced challenges in developing a cohesive response due to poor communication and coordination among various agencies (World Bank, 2020b).

This lack of synergy not only weakens the region's ability to respond to health emergencies but also erodes public trust in health systems. Strengthening coordination mechanisms, such as establishing centralised command structures, fostering cross-sector partnerships, and enhancing information-sharing platforms, is essential to ensure a more unified and efficient response to health crises.

Limited Government Commitment: The sustainability of effective health initiatives in the SADC is hindered by inconsistent government commitment, leading to underfunding and disruption of critical health programs. Political instability, shifting national priorities, and competing demands for scarce resources often result in weak investment in public health infrastructure and preparedness. While some SADC countries demonstrate strong political will and well-coordinated health responses, others struggle with inadequate funding and poor coordination. For example, during the COVID-19 pandemic, Zambia faced challenges in developing a cohesive response due to poor communication and coordination among various agencies (World Bank, 2020b). This lack of synergy not only weakens the region's ability to respond to health emergencies but also erodes public trust in health systems. Strengthening coordination mechanisms, such as establishing centralised command structures, fostering cross-sector partnerships, and enhancing

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The lack of sustained political commitment across the region weakens health systems and limits PPR. Addressing this issue requires stronger political will, increased budgetary allocations for health, and strategic multi-stakeholder partnerships to ensure consistent funding and long-term support for health programs.

4.8 Sources of inefficiency in the use of PPR resources

The table 8 below highlights key inefficiencies in resource allocation and utilisation for health PPR in Zambia. While the country has made notable progress in increasing budgetary allocations to its health sector, systemic inefficiencies such as delayed fund disbursement, mismanagement of resources, underspending, lack of coordination, procurement inefficiencies, and local capacity constraints continue to undermine the effectiveness of emergency health interventions. These challenges hinder timely responses to public health emergencies, leaving critical gaps in preparedness and response systems. Addressing these inefficiencies is crucial for improving Zambia's ability to manage future health crises and ensuring that allocated resources translate into tangible health outcomes for its population.

Delayed Fund Disbursement: Delayed fund disbursement remains one of the most pressing challenges in Zambia's health sector, particularly during emergencies. During the COVID-19 pandemic, the late release of allocated funds severely hampered the procurement of medical supplies, the establishment of testing facilities, and the implementation of critical measures (World Bank, 2023b). These delays are often exacerbated by bureaucratic approval processes, which create bottlenecks even when legislation provides for emergency funds. For instance, efforts to formalise an emergency fund through a Statutory Instrument (SI) have been slow, limiting its operational effectiveness during critical periods (ZNPHI, 2024). Such delays not only slow down emergency responses but also exacerbate the impact of health crises, leading to increased morbidity and mortality. Timely disbursement of funds is essential to ensure that health systems

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Mismanagement of Resources: Resource mismanagement is a persistent and critical issue in Zambia's health sector, undermining PPR and response efforts. Funds earmarked for health facility rehabilitation, emergency responses, and infrastructure development are sometimes diverted to unrelated projects, detracting from their intended purposes. The Zambia Auditor General's Report (2022) highlighted several

instances of mismanagement, including the misallocation of funds intended for health infrastructure development. Such practices not only create gaps in essential health services but also erode trust among stakeholders and donors, making it more difficult to mobilise resources for future emergencies. Strengthening accountability mechanisms, enhancing transparency, and ensuring the proper use of funds are essential steps to address this challenge and restore confidence in the health system.

Underspensing of Allocated Funds: Despite increased budgetary allocations, Zambia often struggles to utilise these funds effectively. In 2020, only 22.5% of the K1,767.7 million allocated for health surveillance was spent, leaving significant gaps in program implementation (National Assembly of Zambia, 2021). Underspensing is often a result of inefficiencies in planning, bureaucratic delays, and a lack of capacity to execute projects. This underutilisation of resources limits the country's ability to strengthen its surveillance systems, improve preparedness for future health emergencies, and deliver essential health services to the population. Addressing these inefficiencies requires streamlining administrative processes, enhancing the capacity of health institutions to manage and execute projects, and ensuring that allocated funds are used efficiently and effectively.

Coordination Challenges: Effective PPR require strong coordination among key institutions, including the MoH, the DMMU, and donor organisations. However, a lack of coordination often leads to fragmented efforts and delays in implementing critical interventions. For example, during the 2019 cholera outbreak, uncoordinated responses among stakeholders resulted in delays in deploying resources and

resulted in delays in deploying resources and implementing containment measures, exacerbating the spread of the disease (DMMU, 2025). Establishing clear lines of communication, fostering collaboration among stakeholders, and creating integrated response frameworks are essential to ensure that resources are used efficiently and that responses are timely and effective. Improved coordination will also help avoid duplication of efforts and ensure that all stakeholders work towards common goals.

Procurement Inefficiencies: Procurement inefficiencies further complicate Zambia's ability to respond to health emergencies. Misalignment between donor conditions and national priorities often delays the acquisition of essential health supplies. For instance, donor-imposed procurement conditions during the COVID-19 pandemic led to delays in securing critical medical equipment and supplies, hindering the country's response efforts (Katele Kalumba et al., 1996).

Local Capacity Constraints

Zambia's ability to manage surveillance data and respond to health emergencies is hampered by limited local capacity. Many health facilities lack the necessary infrastructure, equipment, and trained personnel to analyse data and implement timely interventions. For example, during the COVID-19 pandemic, the lack of trained epidemiologists and data analysts at the district level resulted in delays in reporting and responding to outbreaks, allowing the virus to spread unchecked in some areas (Mandyata et al., 2017). Strengthening local capacity through targeted training programs, investments in infrastructure, and the deployment of skilled personnel is essential to improve the effectiveness of Zambia's surveillance and

improve the effectiveness of Zambia’s surveillance and response systems. Addressing these constraints will require sustained investment in human resources and infrastructure to ensure that health systems are better equipped to handle future emergencies and protect public health.

Table 8: Inefficiencies in Resource Allocation and Use for Health PPR in Zambia

Category	Zambia
Delayed Fund Disbursement	Delays in releasing emergency funds during COVID-19 pandemic hindered timely actions (World Bank, 2023a).
Mismanagement of Resources	Funds for health facility rehabilitation misallocated to unrelated projects (Zambia Auditor General’s Report, 2022).
Underspending	In 2020, Zambia allocated K1,767.7 million (100%) for pharmaceutical services. However, only K1,369.7 million (77.5%) was released, primarily for COVID-19 and medical supplies, leaving K398 million (22.5%) underfunded. An additional K84.4 million was credited to the Emergency Account, raising total COVID-19-related funds to K1,454.1 million. Despite this, the original budget line for pharmaceuticals remained 22.5% unfunded, highlighting resource allocation challenges during the pandemic (National Assembly of Zambia, 2021) .
Coordination Challenges	Fragmented roles of MOH, DMMU, and donor agencies hindered response to 2019 cholera outbreak (Mushinge, 2024)
Procurement Inefficiencies	Donor conditions sometimes misaligned with national priorities, complicating resource use (Katele Kalumba et al., 1997).
Local Capacity Constraints	Inadequate infrastructure and personnel limit local units' ability to process surveillance data and respond promptly (Mandyata et al., 2017).

4.9 Stakeholders in Surveillance and PPR

The analysis of stakeholders' roles in disease surveillance and preparedness for public health emergencies in Zambia underscores the diverse contributions of governmental agencies, international organisations, NGOs, CBOs, and the private sector. Zambia employs a multi-stakeholder approach to address public health challenges, with implementation strategies, priorities, and roles tailored to the country's unique systemic capacities and public health needs.

mechanisms, and leveraging decentralised structures to improve coordination and response capabilities. International organisations such as the WHO, the Centers for Disease Control and Prevention (CDC), and the United Nations Children’s Fund (UNICEF) play critical roles by providing financial and technical support. However, the scope and nature of their contributions are influenced by specific areas of focus and national priorities.

In Zambia, efforts focus on strengthening local

Table 9: Summary of stakeholders in PPR in Zambia

Stakeholder	Roles
1. Government Departments and Agencies	
MOH	Coordinates national health policies and strategies, focusing on AMR and public health crises (MOH, 2023)
ZNPHI	ZNPHI monitors epidemiological trends and coordinates health research (MOH, 2023). Additionally, it coordinates Public Health Security in Zambia by ensuring robust surveillance systems, effective preparedness, and emergency response mechanisms to support evidence-based decision making.
DMMU	provides “safety net” for protection of the citizenry and their assets and the environment against disasters through a pro-active, community-based, developmental and multi-sectoral (Republic of Zambia, 2023), additionally DMMU supports logistical operations, delivering supplies during crises (DMMU, 2017).
2. International Organisations	
CDC	Enhances disease detection and capacity building through: (i) Governance, advocacy, and operational frameworks. (ii) Public health assets. (iii) Human resource development. (iv) Project management support (Africa CDC, 2021a; ZNPHI, 2023).
World Bank	Supports infrastructure and resource mobilisation during crises (World Bank, 2024). while also providing funds and setting funding conditions (Republic of Zambia, 2023)
USAID	Provides critical funding and technical support for Zambia’s public health programs, including disease surveillance, emergency response, and HIV/AIDS treatment through PEPFAR. However, the 2025 U.S. foreign aid freeze has disrupted USAID-backed health financing, delaying resource flows for pandemic preparedness (Imray et al., 2025).
WHO	Sets global health standards and guidelines, supports pandemic preparedness, and coordinates international responses to public health emergencies. The 2025 U.S. withdrawal from WHO has reduced available funding streams, impacting Zambia’s access to WHO-led emergency financing and technical support (Kyobutungi, 2025).
3. CBOs and NGOs	
NGOs/CBOs	Leverage local contexts to integrate traditional practices with modern strategies (MOH, 2023). And provide for entry points into the community (Republic of Zambia, 2023)
4. Pharmaceutical Bodies	
Pharmaceutical Companies and bodies (e.g. Zambia Medicines Regulatory Authority)	Focus on R&D, including vaccines and treatments during pandemics (MOH, 2023). Furthermore, they Regulate and control standard of medicines (Republic of Zambia, 2023)

Table 9 above provides a detailed overview of the key stakeholders involved in PPR for public health crises in Zambia, focusing on their roles and contributions.

Government Departments and Agencies: The Backbone of National Health Security

The MoH stands at the forefront of Zambia's health surveillance and PPR efforts, serving as the primary coordinator of national health policies and strategies. The MOH's mandate includes addressing critical issues such as anti-microbial resistance (AMR) and managing public health crises, ensuring that the country is equipped to respond to emerging health threats. Supporting the MOH, the ZNPHI plays a pivotal role in monitoring epidemiological trends, conducting health research, and providing evidence-based recommendations to guide public health interventions (MOH, 2023; Republic of Zambia, 2023)

The DMMU plays a pivotal role in PPR by implementing proactive measures to manage disasters effectively. The unit establishes robust preparedness mechanisms to ensure a rapid and coordinated response to public health emergencies, including pandemics. In the event of an outbreak, DMMU activates emergency response protocols, enabling timely search, rescue, and relief operations to save lives and minimise damage to infrastructure. Additionally, the unit facilitates critical logistical operations, ensuring the efficient delivery of essential medical supplies, personal protective equipment, and emergency aid during crises (DMMU, 2017). Beyond immediate response efforts, DMMU focuses on restoring livelihoods and critical life support systems in affected communities. It also implements preventive and mitigation strategies to reduce the disruptive impact of health emergencies on vulnerable populations. Through its comprehensive coordination framework, DMMU aligns stakeholder efforts, avoids resource duplication, and strengthens national capacity to respond effectively to pandemics and other public health threats (DMMU, 2017).

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International Organisations: International organisations play a critical role in Zambia's PPR. The CDC, through initiatives like the Africa CDC, strengthens Zambia's capabilities by enhancing disease detection and capacity building. This includes establishing governance, advocacy, and operational frameworks to streamline outbreak responses, deploying public health assets (e.g., labs, surveillance systems), advancing human resource development through training programs, and offering project management support to ensure effective implementation (Africa CDC, 2021a; ZNPHI, 2023). The World Bank contributes by supporting infrastructure development and resource mobilisation during crises. It also provides financial assistance and sets funding conditions to ensure effective allocation and utilisation of resources (Republic of Zambia, 2023; World Bank, 2024).

In addition to these organisations, the USAID has been a key partner in Zambia's public health programs. USAID provides critical funding and technical support for disease surveillance, emergency response, and HIV/AIDS treatment through initiatives like the PEPFAR. However, the 2025 U.S. foreign aid freeze has disrupted USAID-backed health financing, delaying resource flows for pandemic preparedness and creating challenges for Zambia's ongoing public health efforts (Imray et al., 2025).

Similarly, the WHO plays a vital role in setting global health standards and guidelines, supporting pandemic preparedness, and

coordinating international responses to public health emergencies. The WHO has been a key source of technical and financial support for Zambia's PPR initiatives. However, the 2025 U.S. withdrawal from the WHO has reduced available funding streams, impacting Zambia's access to WHO-led emergency financing and technical support. This has created additional hurdles for the country's ability to respond effectively to emerging health threats (Kyobutungi, 2025).

Together, these international organisations provide a multifaceted support system for Zambia's PPR efforts. However, recent geopolitical shifts and funding disruptions highlight the vulnerabilities associated with over-reliance on external funding and the need for sustainable, locally-driven solutions to strengthen Zambia's public health infrastructure.

CBOs and NGOs: CBOs and NGOs play a crucial role in Zambia's PPR. Leveraging local knowledge, they design culturally relevant public health initiatives, integrating traditional practices with modern strategies to enhance intervention effectiveness, especially in rural and underserved areas. Acting as intermediaries between government agencies and communities, they foster trust and improve health communication (Republic of Zambia, 2023). These organisations also fill service gaps by providing healthcare, conducting education campaigns, and mobilizing communities for surveillance. Their agility is particularly vital during health emergencies, enabling rapid response and resource deployment. Complementing their efforts, Community-Based Volunteers (CBVs) serve as frontline workers, offering essential healthcare services, including malaria testing, home-based care for chronic diseases (HIV, diabetes, kidney disease), child immunisation, and screenings for non-communicable diseases (MOH, 2023; Republic

of Zambia, 2023)

CBVs ensure treatment adherence, reducing strain on formal healthcare facilities while building trust within communities. By collaborating with CBOs and NGOs, they extend the reach of health programs to remote and marginalised areas. (MOH, 2023; Republic of Zambia, 2023). Together, these entities create a resilient health network that strengthens community-based care, enhances PPR, and improves health outcomes across Zambia.

Pharmaceutical Bodies: Pharmaceutical companies and regulatory bodies, such as the Zambia Medicines Regulatory Authority (ZAMRA), play a critical role in **PPR** in Zambia. Their efforts are cantered on research and development (R&D), focusing on the rapid creation and distribution of vaccines and treatments during pandemics (MOH, 2023). By investing in innovative therapies and preventative measures, these entities enhance the country's resilience against emerging health threats. Moreover, ZAMRA ensures the regulation and quality control of medicines, safeguarding public health by enforcing stringent standards for drug safety, efficacy, and availability (Republic of Zambia, 2023). These coordinated efforts help maintain a robust healthcare system capable of responding effectively to pandemics

Guiding Frameworks and Policies

Zambia's approach to disease surveillance and preparedness for public health emergencies (PPR) is anchored in a combination of national policies, legislative frameworks, and international guidelines.

These instruments provide a structured foundation for coordinating multi-stakeholder efforts, ensuring alignment with global standards while addressing Zambia's unique public health challenges.

National Policies and Legislative Frameworks

At the national level, the MoH spearheads policy development through strategic documents such as the National Health Policy (2023), which prioritises strengthening disease surveillance, antimicrobial resistance (AMR) management, and health system resilience (MOH, 2023). The ZNPHI operates under the Public Health Act, which mandates its role in monitoring epidemiological trends, coordinating research, and advising on evidence-based interventions (MOH, 2023).

Disaster management is institutionalised through the Disaster Management Act (2017), which empowers the DMMU to lead logistical coordination, resource distribution, and emergency response during crises (DMMU, 2017). Additionally, Zambia's decentralised governance structure enables local authorities to implement tailored surveillance strategies, guided by the National Decentralisation Policy to enhance community-level readiness (MOH, 2023).

International Frameworks and Alignment

Zambia adheres to the World Health Organisation's (WHO) International Health Regulations [IHR 2005] (WHO, 2020), which underpin its commitment to developing core capacities for early detection, reporting, and response to public health threats (WHO, 2017). Collaborative efforts with the Africa Centres for Disease Control and Prevention (Africa CDC) align with the Regional Integrated Surveillance and Laboratory Network (RISLNET), under disease surveillance and data-sharing mechanisms (Africa CDC, 2021)

enhancing cross-border disease surveillance and data-sharing mechanisms (Africa CDC, 2021)

International partnerships are further guided by the United Nations Sustainable Development Goals (SDGs), particularly SDG 3 (health and well-being), which informs initiatives to build resilient health infrastructure with support from organisations like UNICEF and the World Bank. The World Bank's financing of health system strengthening projects, such as the Emergency Health and Nutrition Security Project, reflects alignment with Zambia's national priorities (World Bank, 2022).

5.0 Summary of findings and recommendations

5.1 Summary findings

- **Strategic Integration with Operational Gaps:**

Zambia's NHSP and OHSP formally integrate PPR, emphasizing surveillance, multi-sectoral collaboration, and health system resilience. However, operational challenges—such as fragmented coordination, underfunded laboratory networks, and weak subnational governance—hinder full implementation. While aligned with global frameworks like the International Health Regulations (IHR), systemic inefficiencies persist, limiting equitable resource distribution and preparedness.

- **Financing Gaps and Inequities:** Zambia's health budget, constituting 9–10% of national spending, remains below the Abuja Declaration's target of 15%. Annual funding for PPR is estimated at \$35–50 million, which is inadequate to bridge the initial \$25–35 million gap in infrastructure and workforce development. Across the SADC region, only 11% of total health expenditures are allocated to PPR, with low-income countries spending as little as \$0.1–0.3 per capita on preparedness. Furthermore, the decline in Global Development Assistance for Health (DAH) for COVID-19 post-2021 underscores the risks of an unsustainable dependence on donor-driven funding priorities.

- **Chronic Underfunding and Donor**

Dependency: Zambia's health budget allocations (9–10% of national spending) fall short of the Abuja Declaration's 15% target.

PPR-specific funding is fragmented, with less than 1% of the health budget allocated to ZNPHI activities. Over 80% of PPR financing relies on volatile external donors, exposing the system to shifting priorities. Domestic contributions stagnated (e.g., ZMW13.25 million

million annually for surveillance), while donor funding surged to 53% in 2023, highlighting unsustainable dependency.

- **Inefficiencies in Resource Utilisation:** Systemic inefficiencies include delayed fund disbursement (e.g., COVID-19 response delays), mismanagement (diverted rehabilitation funds), and underspending (22.5% of 2020 surveillance funds unutilised). Procurement bottlenecks, bureaucratic hurdles, and misaligned donor conditions further hinder responses. Local capacity constraints, such as shortages of epidemiologists and outdated data systems, delay outbreak detection and reporting.

- **Fragmented Coordination and Governance:** PPR efforts suffer from disjointed collaboration among ministries, agencies, and donors. For example, uncoordinated responses during the 2019 cholera outbreak delayed containment. Despite frameworks like the National Health Security Action Plan (NHSAP), weak legislative enforcement and competing priorities undermine accountability. SADC nations face similar fragmentation, with limited regional resource pooling and unaligned emergency funds.

- **Logistical and Capacity Constraints:** Poor infrastructure (e.g., inadequate road networks, uneven storage facilities) delays medical supply distribution, particularly in rural areas. Workforce shortages—especially in epidemiology and laboratory expertise—and inadequate diagnostic tools limit outbreak responses. Climate change and population mobility compound these challenges, straining surveillance systems like the e-IDSR.

- **Stakeholder Roles and Policy Frameworks:**

Key stakeholders include the MOH, ZNPHI, and DMMU, supported by international partners (WHO, Africa CDC) and NGOs. While policies like the ZNPHI Act (2020) and Disaster Management Act (2017) provide structure, implementation gaps persist. Community-based volunteers and NGOs enhance grassroots surveillance but require stronger integration into national systems.

- **Regional Vulnerabilities:** SADC countries mirror Zambia's challenges, including logistical barriers, data system gaps, and political instability. While initiatives like the Africa CDC's Regional Collaborating Centres (RCCs) foster collaboration, limited domestic financing and donor-driven agendas weaken sustainable preparedness. Regional mechanisms (e.g., SADC Pooled Procurement Services) remain underutilised due to inconsistent contributions and coordination.

5.2 Recommendation

- **Expedite the Operationalisation of the National Public Health Emergency Fund:** Zambia must fast-track the implementation of this fund to ensure rapid response during health crises. Delays in its operationalisation limit the country's ability to mobilise emergency resources. The government should establish clear legislative backing, implement transparent governance mechanisms, and introduce automatic funding triggers that release emergency resources based on predefined outbreak severity levels.

A multi-stakeholder approach involving government, private sector, and civil society will enhance accountability and sustainability.

- **Prioritise Stable Domestic Funding for Disease Surveillance and Control:** To reduce reliance on external donors, Zambia must allocate a fixed percentage of its national budget to PPR.

budget to PPR. Implementing innovative financing mechanisms—such as sin taxes on tobacco, alcohol, and sugary drinks, mobile money transaction levies, tolls, and airline ticket surcharges—will create a stable funding stream. Legal provisions should ensure these funds are strictly directed toward PPR initiatives and equitably distributed across provinces and districts.

- **Establish Dedicated Funding Streams for Preventive Health Measures:** Preventive health initiatives, including disease surveillance, early warning systems, and healthcare worker training, require consistent funding. Zambia should create a ring-fenced investment fund dedicated to supporting CBOs, strengthening community disease surveillance, and promoting health education in underserved areas. A sustainable, automated disbursement system should be established to prevent bureaucratic delays.

- **Streamline Budget Absorption and Execution:** Inefficiencies in financial disbursement and procurement processes hinder the timely execution of health projects. Zambia must establish a real-time health expenditure tracking system to monitor fund utilisation, ensure transparency, and prevent misallocation. Decentralizing financial decision-making to provincial and district health offices will further enhance budget efficiency and allow for more localised, effective responses.

- **Create a Cohesive Health Financing System:** Fragmented financing leads to inefficiencies and duplications in health funding. Zambia should consolidate funding from government, donors, and private investors into a unified national health financing framework.

Establishing an inter-ministerial coordination unit—involving health, finance, and disaster management sectors—will improve strategic planning and financial alignment for PPR.

- **Invest in Technological Advancements and**

Public Health Advocacy: Enhancing disease monitoring and response through technology is essential for effective PPR. Zambia should expand the e-IDSR and EBS platforms to enable real-time data integration. Collaborating with technology firms to develop AI-driven analytics for outbreak prediction and improve mobile-based disease reporting will significantly strengthen early detection and response efforts. Additionally, public health advocacy campaigns should focus on encouraging early disease reporting, promoting vaccinations, and educating communities on preventive measures.

- **Address Logistical and Capacity Constraints:**

Weak infrastructure and limited skill construct emergency storage facilities for critical medical supplies, strengthen digital health information systems for real-time data sharing, and increase training programs for epidemiologists, laboratory technicians, and frontline healthcare workers. Offering incentives and improved working conditions will help retain skilled professionals in rural and high-risk areas.

- **Engage the Private Sector in Health**

Infrastructure Development: To bridge gaps in diagnostic facilities, surveillance systems, and laboratory services, Zambia should leverage Public-Private Partnerships (PPPs) to mobilise investments. Private sector involvement in modernizing healthcare infrastructure, strengthening supply chains, and developing rapid disease detection systems will enhance Zambia's preparedness for future outbreaks.

- **Diversify Funding Sources to Mitigate Global**

Financing Fluctuations: Given the decline in global pandemic financing post-COVID-19, Zambia must reduce dependence on donor contributions. This requires expanding domestic revenue sources, fostering private-sector partnerships, and engaging in international collaborations. By integrating PPR funding into broader healthcare financing frameworks, Zambia can ensure long-term sustainability and counteract donor fatigue.

- **Advocate for Regional PPR Financing**

Mechanisms: Strengthening Zambia's PPR will require a coordinated regional approach. The government should advocate for the creation of an AU Pandemic Preparedness Fund, allowing countries to pool resources for shared priorities such as emergency response coordination, stockpiling essential medical supplies, and workforce training. Establishing a legally backed national emergency health fund, supported by statutory instruments, will further enhance Zambia's ability to deploy resources swiftly in times of crisis.

6.0 Conclusion

Zambia's PPR financing remains inadequate, fragmented, and heavily dependent on external sources, leaving the country vulnerable to recurring public health emergencies. While efforts to enhance domestic resource mobilisation and strengthen health financing frameworks are underway, significant gaps persist in surveillance infrastructure, laboratory capacity, emergency response mechanisms, and workforce training. Without sustainable and predictable financing, Zambia's ability to respond effectively to future health threats will remain constrained. Strengthening governance, operationalizing the **National Public Health Emergency Fund (NPHEF)**, and **adopting innovative domestic financing mechanisms** are critical steps toward reducing donor dependency and ensuring long-term health security. Furthermore, integrating PPR financing into broader health system strengthening efforts will not only improve Zambia's capacity to manage health emergencies but also accelerate progress toward Universal Health Coverage (UHC) by ensuring equitable access to essential healthcare services. As the host of the **Africa CDC Southern Africa Regional Collaborating Centre (RCC)**, Zambia has a unique opportunity to lead regional health security efforts through enhanced collaboration, resource pooling, and knowledge sharing. By prioritizing domestic investment in health security and fostering multi-sectoral partnerships, Zambia can build a more resilient, responsive, and sustainable health system that safeguards its population against future pandemics.

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