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Experiences in Integrating Severe Acute Malnutrition into the National Health System in Papua New Guinea

Progress Review

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ABBREVIATIONS AND ACRONYMS

ASEAN	The Association of Southeast Asian Nations
GAP	Global Action Plan on Child Wasting
IMAM	Integrated Management of Acute Malnutrition
IMCI	Integrated Management of Childhood Illness
IYCF	Infant and Young Child Feeding
LLG	Local Level Government
MOH	Ministry of Health
MUAC	Mid-upper Arm Circumference
NDOH	National Department of Health
NHIS	National Health Information System
NHP	National Health Plan
NNP	National Nutrition Policy
PNG	Papua New Guinea
PHA	Provincial Health Authority
PHO	Provincial Health Office
RUTF	Ready-to-Use Therapeutic Food
SAM	Severe Acute Malnutrition
SUN	Scaling Up Nutrition
UHC	Universal Health Coverage
UNICEF	The United Nations Children's Fund
WHO	World Health Organization

EXECUTIVE SUMMARY

Papua New Guinea (PNG), a nation comprised of over 600 islands, grapples with the unique challenges posed by its complex geography. Approximately 80 percent of the population resides in rural areas, where limited road infrastructure and the absence of railways hinder accessibility. This geographical complexity, coupled with low economic development and infrastructure, necessitates external financial support to meet healthcare budgets effectively. Additionally, a shortage of healthcare workers further exacerbates the healthcare challenges in PNG.

Child malnutrition rates in PNG are alarmingly high, with 49.5 percent of children under the age of 5 suffering from stunting, and 14.1 percent experiencing wasting, as reported by the 2010 Demographic Health Survey.

In 2016, PNG joined the Scaling Up Nutrition (SUN) movement and introduced Integrated Management of Acute Malnutrition (IMAM) in six provinces with UNICEF's assistance. UNICEF provided crucial technical and financial support between 2014 and 2018, including the adaptation of World Health Organization (WHO) guidelines, revisions to the nutrition content of the *Standard Treatment for Common Illnesses in Children guidelines,* updates to medical curriculum content, and in-service health worker training. In 2018, Mid-Upper Arm Circumference (MUAC) screening data was integrated into the National Health Information System (NHIS). Despite these efforts, the National Nutrition Policy (NNP) for 2021-2030 identified severe under-resourcing and a lack of clarity about the extent of malnutrition in many regions.

This study documents the integration of severe acute malnutrition (SAM) treatment services into PNG's healthcare system. The analysis evaluates strengths and areas for improvement across six critical health system functions.

Key findings

1. Governance: PNG has made strides in prioritizing nutrition since joining the SUN movement, but challenges persist in implementing health system reforms and extending SAM management services to all provinces. While UNICEF's investment has facilitated SAM management integration in six provinces, there remain 16 provinces awaiting this service. To enhance the integration of SAM management within the healthcare system, three critical actions are required. Firstly, there is a need to update strategic health documents to incorporate management of SAM. Additionally, advocacy efforts should be intensified to secure increased commitment from both national and provincial governments, particularly for the continued expansion of SAM treatment in the eight priority districts identified in the Global Action Plan on child wasting. Furthermore, establishing stronger connections and fostering collaboration between various programs is crucial to harness synergies and alleviate the strain on local government resources. These actions can collectively enhance the integration of SAM management within the healthcare system of Papua New Guinea.

2. Health Financing: Central-level investment and dedicated budgets for nutrition and SAM management are currently inadequate. A heavy reliance on external support remains a concern. To ensure successful integration, it is essential to fully incorporate SAM management into the National Department of Health (NDOH) budgets. Efforts should focus on systematic inclusion in provincial-level health budgets, encompassing in-service training and supportive supervision.

3. Service Delivery: While partial IMAM capacity exists in six out of 24 provinces, challenges persist due to systemic bottlenecks, infrastructure gaps, and limited referral systems. Substantial progress has been made in establishing outpatient and inpatient SAM management services since 2015. However, integration remains slow and challenging. Rapid nationwide scaling up of SAM treatment is currently considered too ambitious given these challenges. To enhance early detection and service coverage, investments in nutrition training, supportive supervision, and systematic screening are imperative. Additionally, community-based initiatives to boost demand for child health and nutrition services are essential.

4. Health Workforce: PNG faces shortages of health workers, particularly at the primary care level. Existing healthcare personnel often lack the necessary skills for SAM detection and treatment, and those with expertise are predominantly situated at higher levels of healthcare. Addressing these shortages necessitates expanded geographic distribution, enhanced nutrition training, and increased supportive supervision. Explicit inclusion of SAM management in job descriptions, integration into preservice education curriculum modules for medical and paramedical professionals, and systematic incorporation into continuing professional development, accompanied by corresponding budget allocations, are essential.

5. Information Management: The health information system lacks adequate nutrition data, negatively impacting planning, and service quality. While the integration of MUAC into the NHIS in 2018 was a significant step forward, heavy reliance on UNICEF and partners for SAM reports persists. In provinces where IMAM has been implemented, SAM indicators are collected using parallel systems. Efforts should focus on standardizing data collection, analysis, and reporting, and integrating nutrition information into the NHIS.

6. Medical Products, Vaccines, and Technologies: The medical supply chain faces inefficiencies and interruptions, hindering service delivery. While notable efforts have been made, such as including nutrition items in the PNG NDOH's Medical and Dental Catalogue and allocating a budget line for procurement, there is still a reliance on UNICEF for nutrition-related items. Continuous supply chain enhancements, including procurement processes, are necessary to ensure the consistent availability of SAM treatment items.

In summary, the Government of PNG, supported by UNICEF, has made commendable efforts to integrate Severe Acute Malnutrition (SAM) services into its healthcare system since 2014. Nevertheless, significant parts of the country remain underserved. The challenges related to SAM integration extend from broader structural weaknesses within PNG's healthcare system, impacting service delivery, human resources, supply chains, information management, and financing.

Specific to the SAM program, addressing challenges requires:

1. **Enhanced Financing:** Full integration of SAM supplies into the NDOH budget, sustained financial commitment at central and local levels, and effective budget planning at the provincial level.
2. **Community Engagement:** Increasing community outreach and creating demand for SAM services.
3. **Health Workforce Training:** Prioritizing training for healthcare professionals in SAM management through pre- and in-service training programs.
4. **Improved Supply Chain:** Ensuring a steady supply of RUTF to meet program needs.

Lastly, considering the complexities and challenges listed, rapid scaling-up of IMAM services across the entire country is deemed overly ambitious. Instead, a cautious and deliberate scaling-up strategy is advised, coupled with sustained political leadership at all levels of government.

INTRODUCTION

Papua New Guinea (PNG), the world's third-largest island nation at 462,840 sq. km, is renowned for its incredible linguistic diversity with 839 languages. After gaining independence in 1975, PNG faced the complex task of uniting once-isolated local communities. Administratively, PNG is divided into four regions and 22 province-level divisions, including Bougainville (an autonomous region), and the National Capital District. These provinces further subdivide into 89 districts, with 318 rural and 31 urban local level government areas[1].

Child wasting treatment services were introduced into Papua New Guinea's (PNG) health system in 2014, followed by advocacy, capacity building, and system-strengthening efforts. This resulted in the prioritization of child wasting in national health and nutrition plans. In 2020, PNG joined 23 other countries globally as front-runner counties implementing the Global Action Plan (GAP) on child wasting[2].

Initially, the management of Severe Acute Malnutrition (SAM) in PNG was inadequate, as highlighted by a UNICEF review in 2014[3]. The review reported the absence of essential therapeutic resources and high hospital mortality rates. To revitalize SAM treatment, the Ministry of Health sought UNICEF's support, starting at the General Hospital in Port Moresby, and expanding to provincial hospitals and health centres.

This study aims to review the progress in integrating SAM treatment services into PNG's health system and identify gaps and opportunities for further strengthening the routinization of wasting treatment services in primary healthcare. The findings are based on a literature review and key informant interviews conducted between November 2019 and November 2021.

This report begins by discussing the notion of integration, exploring the concept of integrating health services, and describing the definition and methodologies used for this review. The report includes an analysis of the PNG health system's structure and functioning, along with the history and process of integrating severe wasting management into the health system. Understanding these two essential parameters is critical to fully comprehend the health system's capacity for integrating the treatment of wasting.

Integration concepts and principles

The World Health Organization (WHO) defines integrated health services as the management and delivery of a comprehensive range of health interventions, encompassing health promotion, disease prevention, diagnosis, treatment, disease management, rehabilitation, and palliative care services. These services are coordinated across different levels and locations of care, both within and beyond the health sector, tailored to individuals' needs throughout their life course[4].

Furthermore, Salam et al define nutrition integration as *"the extent of adoption and eventual assimilation of nutrition interventions into critical health system functions (building blocks)[5]."*

This study used a health system perspective for integration, defining integration as the: ***"the degree to which interventions for Severe Acute Malnutrition (SAM) are adopted and assimilated into the key functions of PNG's national health system."***

Two guiding principles informed the approach to integration in this study:

a) Integration is viewed as a continuum, encompassing various forms aimed at delivering a seamless healthcare experience, reducing fragmentation, enhancing efficiency, and elevating care quality.

b) The study emphasizes horizontal care programming, which embraces a holistic approach addressing multiple diseases and health issues in an integrated manner. This approach contrasts with the vertical approach, which is disease-specific and top-down. Horizontal integration aims to provide comprehensive, patient-centred care and strengthen the entire health system with a system-wide perspective.

Health situation

As of 2022, PNG's population is approximately 9.7 million, with a 4.2 million increase since 2000[6]. Remarkably, 87 percent of the population resides in rural areas, relying predominantly on agriculture. Notably, 35 percent of the population is under 15 years old, while only 4 percent are over 65.

Since 1980, Papua New Guinea (PNG) has seen a rise in life expectancy from 49 to 63 years[7]. Despite being in an early demographic transition, the country faces persistent health challenges, especially in maternal and child health and communicable diseases, primarily affecting rural and remote populations. PNG is facing a double healthcare burden—rapid growth in non-communicable diseases alongside a high prevalence of communicable diseases. Notably, PNG has one of the world's highest rates of newborn mortality (20 per 1,000 live births) and an under-five mortality rate of 57 per 1,000 live births, resulting in approximately 15,400 children, or one in 13, dying annually from preventable diseases[8].

Nutrition situation

As per the Global Nutrition Report 2022[9], PNG is 'on course' to meet childhood overweight World Health Assembly target but has made no headway in reducing anaemia among women aged 15 to 49, impacting 34.4 percent of this demographic. Data on low birth weight and exclusive breastfeeding in PNG remains insufficient for evaluation, although about 59.7 percent of infants aged 0 to 5 months are exclusively breastfed, based on limited data quality.

PNG still faces significant child malnutrition challenges, with a high stunting rate of 49.5 percent among children under 5, the highest in the region. Additionally, 14.1 percent of children under 5 are affected by wasting, placing PNG among the highest globally for both stunting and wasting rates[10]. There is considerable variation across regions and a lack of clarity about the extent and distribution of the problem in many parts of the country[11].

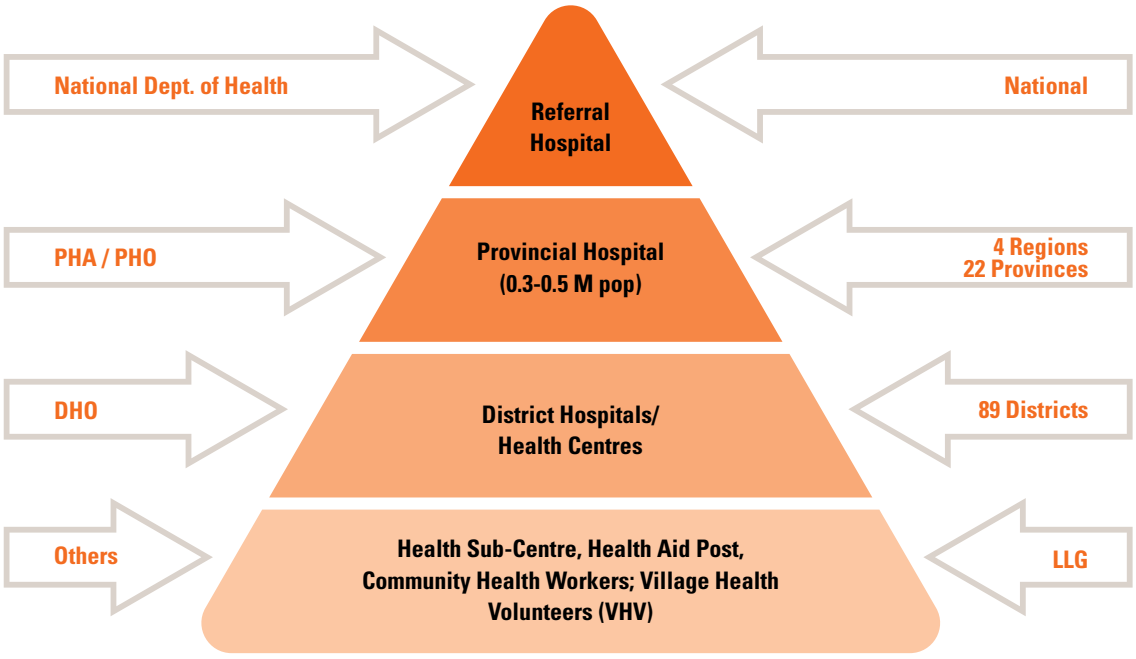
Structure of the health care system

PNG's healthcare system shifted to a decentralized model in 1995, with provincial administrations managing health budgets[12]. It is based on primary healthcare principles and comprises of 1,800 "functioning aid posts" (transitioning to community health posts by 2030) and approximately 800 subhealth/health centres[13]. Secondary healthcare includes 22 provincial hospitals, with one serving as the national referral hospital.

Local governments oversee health centres, subcentres, rural hospitals, and aid posts, while the National Department of Health centrally procures medical supplies for distribution to the provinces. Tertiary care remains under the NDOH.

Churches play a prominent role in healthcare, providing over 50 percent of services, mainly in rural areas[14]. Employer-related healthcare exists in agriculture and mining, and there's a small private medical sector, as well as a more extensive traditional medicine sector.

Figure 1: PNG health service delivery organization



Source: UNICEF PNG Internal Report, 2019

HEALTH RELATED REFORMS

- **Public Hospitals Act (1994):** Definition of provincial hospitals' role: supervising and supporting rural clinical services in primary health care facilities within the province.
- **National Health Administration Act (1997):** Legal framework for linking and consolidating the functions of all levels of government and other agencies involved in the delivery of health care. Development of national standards, administrative functions, boards, and management committees at national, provincial and district levels (development of the National Health Board).
- **Provincial Health Authorities Act (2007):** Creation of a statutory body at provincial level responsible for both hospital and rural health services.
- **Intergovernmental relations (functions and funding) Act (2009):** Amendments to the new organic law and changes in the way the government distributes funds to provinces (according to the cost of delivery services).
- **PNG's Vision 2050 (2009):** To "be a smart, wise, fair, healthy and happy society by 2050."
- **National Health Plan 2011-2020:** Focused on improved service delivery and primary health care to achieve eight key result areas to reach the goal of "a healthy and prosperous nation for all, both now and for future generations."
- **National Health Plan 2021-2030:** Developed every 10 years, it details the health sector policies and strategies. The latest plan: "leaving no one behind is everybody's business," was developed with the aim of empowering citizens to take ownership of their health and wellbeing.
- **National Health Service Standards for PNG (2011-2020):** Clarification of the functions of the seven levels of the healthcare system (1) aid post; 2) health centre; 3) urban clinics; 4) district hospital; 5) provincial hospital; 6) regional hospital; 7) PNG referral hospital- Port Moresby General).
- **Integrated management of childhood illnesses policy (2014):** Defines the roadmap for coordination, planning and management in PNG.
- **Free primary health care and subsidised specialist services policy (2013):** Implementation of the Alotau Accord in relation to health (removing user fees for primary health care and further subsidizing specialized health services).
- **Child and Adolescent Health Plan (2021-2030) Third edition:** Designed as a blueprint for progress in child health, and to provide guidance for provinces and districts, managers and programme coordinators, paediatricians, and nurses to align local activities with the National Plan.

Nutrition governance

PNG joined the **Scaling Up Nutrition Movement** in April 2016. A 2021 Scaling Up Nutrition publication reports[15] that the Government of PNG has institutionalized nutrition governance systems, but higher-level leadership was needed to ensure that all in-country stakeholders work together to support the government in its efforts. *"The establishment of the Nutrition Sector, which brings together stakeholders from different sectors (government entities, development partners, civil society organizations, academia, faith-based organizations and business, among others) is an ideal platform to collectively realign priorities of varying sectors into one consolidated priority that strategizes its implementation into national and subnational priorities."*

In terms of governance, the implementation of the nutrition specific and nutrition sensitive interventions are administered by individual government departments or through the activities of development partners without real coordination as mentioned in the national nutrition policy 2016-2026[16]. There are limited nutrition components in the sectorial plans in Department of Health, Agriculture & Livestock, Education and Community Development and few examples of inter-sectorial collaboration between departments on delivering nutrition outcomes. Specific budget line items focusing on nutrition activities are also missing from national strategies. PNG is also in need of better nutrition responses hindered by a lack of data on key nutrition indicators.

At the provincial and district levels, nutrition specific and nutrition sensitive interventions are not included as part of Medium Term District Plans and less than half of the 22 provinces have a designated nutrition officer[16].

Nutrition related policies and plans

- **Baby Feed Supplies (Control) Act (1977).**
- **National Food and Nutrition Policy (1978)** focused on strategies to improve systems of food production, availability, and nutrition.
- **National Nutrition Survey (1983)** informed the development of the 1995 nutrition policy.
- **National Nutrition Policy (1995)** replaced the 1978 policy and was developed by and inter-sectoral committee.
- **National Nutrition Survey (2005)**
- **Household Income and Expenditure Survey (2010)** validated many of the results of the 2005 survey, highlighting that little progress had been achieved in reducing the impact of malnutrition in PNG.
- **National demographic and health survey (2016)** included a nutrition module.
- **National Health Plan (NHP) (2011– 2020),** with a focus on reducing the immediate and long-term impact of malnutrition in PNG as an essential step to reach the goals of Vision 2050.
- **Infant and Young Child Feeding** policy (2013-2023) complemented the 1997 Baby Feed Supplies (Control) Act.
- **Multisectoral National Nutrition Policy (NNP)** (2016-2026) replaced the 1995 NNP. It outlines seven priority objectives to promote improved nutrition.
- The **"nutrition sector"** replaced the nutrition cluster in 2021. It provides a platform for coordinated reporting, information-sharing, technical capacity, and other resource needs. The NDOH was the chair at the time of this study.

METHODS

The study was conducted between November 2019 and November 2021 using a mixed-methods qualitative approach to study factors that influenced the integration of SAM into the health system in PNG. Data were collected data through two distinct channels: an extensive literature review and key informant interviews.

Thematic literature review

The literature review involved reviewing information on three main topics:

- The national health system in PNG, child health and nutrition services
- Regional and national guidance on integration of health services and health system strengthening.
- Documented experiences of the integration of SAM into the PNG health system

Sources of documentation in the public domain were identified through an internet search using key words entered in a web browser. The MOH and UNICEF provided further documentation. A list of the sources for the literature review can be found in **Annex 1.**

Key search words used: Health integration, health system, integrated care, integration of health and nutrition services, integrated management of childhood illnesses, universal health coverage, nutrition, SAM management, acute malnutrition/wasting.

Key informant interviews

Ten key informants were invited by UNICEF via email or phone to complete a questionnaire comprised of 31 questions thematically arranged around the building blocks of the health system, following the Deconinck framework[17].

Seven out of the ten key informants responded and returned their completed questionnaires. Among these respondents, four were from the national level and three were at the provincial level. Following the written questionnaire responses, four of these key informants engaged in in-depth interviews with a UNICEF consultant. These interviews, lasting approximately one hour each, aimed to validate the interpretation of their questionnaire responses and obtain additional insights for clarification. Detailed information about the respondents can be found in **Annex 2.**

Tools for analysis

The integration of a novel service into the healthcare system is a multifaceted and ever-evolving process Therefore, the evaluation of SAM integration into the healthcare system employed two interconnected layers of analysis, utilizing both the literature review and insights from key informant interviews. These dual analyses work in tandem, offering a comprehensive and holistic view of the integration status. Together, they paint a complete picture of the situation at hand.

A) Deconinck's diagnosis tool (adapted): The extent of SAM integration in the health system (2015)

The initial layer of analysis involved a systematic review of indicators associated with each of the six health system functions, assessing the level of integration of Severe Acute Malnutrition (SAM) within the healthcare system. This assessment employed a diagnostic tool adapted from Deconinck *et al.*[18], which delves into specific indicators, pinpointing priority integration actions. It also facilitates the ongoing monitoring of progress and changes expected in the coming years. This diagnostic tool was developed based on insights from existing literature,[5,19,20] and comprises a total of 29 indicators. For this study, we selected 25 out of

the 29 diagnostic indicators that were most relevant to our investigation. Additional details on the health system functions we measured can be found in **Annex 3.**

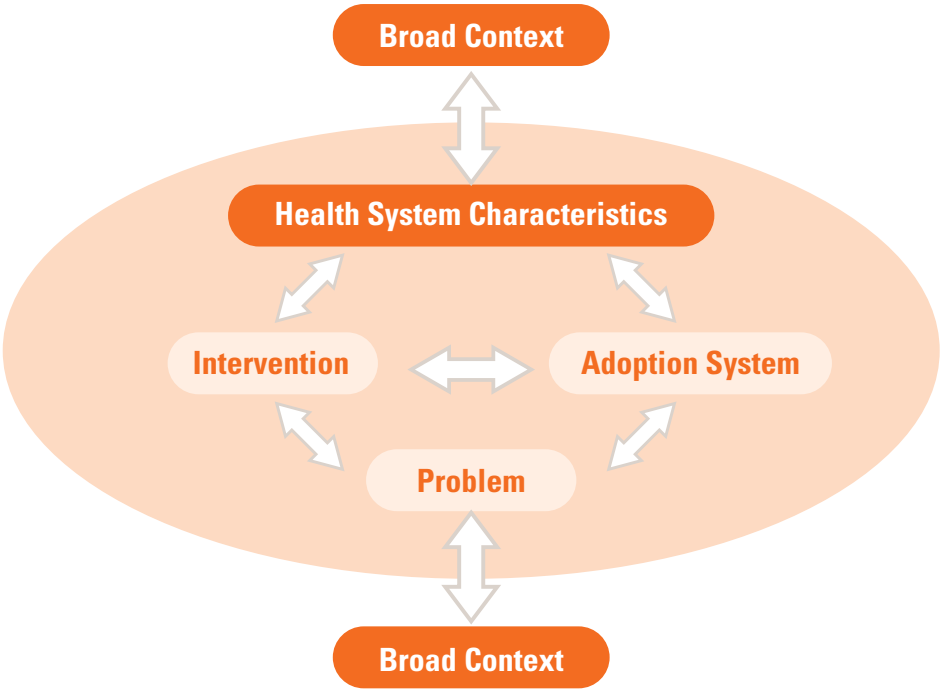
The degree of integration of interventions was systematically tabulated and scored, ranging from: a) **no integration** (indicating no adoption or assimilation of SAM treatment), to b) **partial integration** (some degrees of adoption or assimilation), and c) **full integration** (indicating that functions, activities, systems, or structures are integrated into the mainstream and routine).

B) Atun framework (2010)

The second layer of analysis employs the Atun Framework[21] to assess factors influencing integration. This framework breaks down 'integration' into facets linked to critical health system functions, aiding in the analysis across settings and programs. It identifies factors that influence the integration of new interventions into national health systems, facilitating recommendations. This framework was used in various reviews related to SAM integration (e.g., Bangladesh[5] and Niger[19]).

While the ideal approach involves developing this framework at the country level through focus group discussions or workshops, our study adapted due to logistical constraints. We analyzed health system functions in the context of PNG, drawing insights from a literature review and key informant interviews, refined with UNICEF feedback. This process helped pinpoint key actions and areas of focus for integrating severe wasting treatment services into routine healthcare. Factors were assessed as promoting (+), hindering (-), or both promoting and hindering (+, -).

Figure 2: Conceptual framework for analysing integration of targeted health interventions into health systems (Atun et al. 2010)



Limitations of the study

This study faced a nine-month interruption due to the COVID-19 pandemic and related movement restrictions. Consequently, key informant interviews had to be conducted remotely via Skype or phone calls, making it unfeasible for province-based interviews. Ideally, the findings from the Atun Framework should have been developed and validated through focus group discussions. A country level validation is thus advised to develop specific actionable recommendations.

RESULTS

Child wasting treatment services were first introduced into Papua New Guinea's (PNG) health system in 2012. A UNICEF review conducted in 2014 at the General Hospital in Port Moresby and other major provincial hospitals in the country revealed critical issues. Despite the availability of WHO guidelines, child mortality rates remained high among those with Severe Acute Malnutrition (SAM), and essential therapeutic resources such as Formula-75, Formula-100 therapeutic milks, and RUTF were lacking to provide adequate treatment. Recognizing the urgent need for improvement, the Ministry of Health sought UNICEF's assistance to revitalize SAM treatment. This initiative commenced at the General Hospital in Port Moresby, which would later serve as a training centre, with plans to expand these improvements to provincial hospitals and health centres across the country.

Figure 3: SAM integration milestones in the health system

2014

- **UNICEF review** of the quality of SAM treatment sevices in national and provincial hospital
- **Paediatric Society 50th Symposium:** SAM treatment protocols for Doctors, Nurses, CHWs, and Health Extension Officers
- **UNICEF trained 90 health workers** from 15 provincial hospitals and provided therapeutic supplies

2015

- **Weight-for-age percentiles** included in Nutrition information system

2016

- **WHO's 2013 revised guidelines** for managing SAM adopted
- Standard **Treatment for Common Illnesses in Children** version 10 revised to include SAM

2017

- **Preservice medical curriculum** nutiriton content updated including SAM treatment

2018

- **Inservice training** for over 1300 health workers
- **SAM management in annual plans of five provinces and budget allocation** for monitoring
- **MUAC** added **in child health book**
- **SAM indicators included in National Nutrition Multisectoral Plan** (2018-2026)

2019

- **Nutrition supplies added into PNG's Medical and Dental catalogue,** 11th edition
- UNICEF hands over procurement of Nutrition supplies to the Government

Situation analysis of Integration of SAM in the PNG health system

This section describes the progress made in integrating SAM treatment services in each of the six health system building blocks and identifies general strengths and areas of improvement. For every health system building block, a set of benchmarks derived from Deconinck's model, and factors that positively or negatively influence integration based on the Atun Framework, have been utilized to identify strengths and areas needing improvement.

Governance

Summary

Overall, there are significant challenges related to the health system. Health reforms which were initiated since 2007 are not yet fully operational in some provinces. However, there has been a noticeable shift in the prioritization of nutrition since the country joined the Scaling Up Nutrition movement, with the development of robust policies and plans to improve the nutritional status of the population. A significant turning point for the treatment of SAM was reached in 2014 following a UNICEF review of the quality of care. Since then, UNICEF support to the MOH has facilitated the integration of SAM management into six provinces, but 16 provinces are still waiting for this service to be rolled out. The national roadmap for implementing the GAP has identified 8 priority districts for scaling up SAM treatment services.

Recommendations:

- Update strategic key health documents to include information on the integrated management of SAM.
- Advocate for an increase in commitment from the national and provincial governments to continue the scale-up of SAM treatment in the 8 priority districts identified in the GAP roadmap.
- Establish greater links and relations between programs to boost synergies and avoid overburdening the local government level.

Table 1: Integration level of SAM treatment services in the health governance function in PNG

Leadership and governance		Extent
Policy setting	National health and nutrition policies with management of acute malnutrition as part of comprehensive child health care* (i.e., integrated management of childhood illness and child hospital care)	Partial
National guidelines	National guidelines for integrated management of acute malnutrition supporting comprehensive child health care	Full
Technical leadership	Technical advisory group for comprehensive child health care overseeing wasting scaling up within health system	No
Regulation	Standards of care for integrated management of acute malnutrition are set and enforced	Partial
Coordination	Extent that wasting treatment is planned for together with other health services at the provincial and local level government level	No

Overall context of the governance building block

According to a 2010 study[22] of the health system, there is a pressing need for substantial strengthening of health services. The study reveals poor outcomes across various indicators, with deteriorating trends in critical areas like maternal health. It identifies significant challenges rooted in the structural, cultural, and geographical dimensions of the health sector. One contributing factor mentioned for the decline in the health system's performance is *"the inadequate management of the highly decentralized and fragmented National Health System."*

To address these issues, the Provincial Health Authorities Act of 2007 advocated for the establishment of a unified provincial health system. Under this act, a single provincial health authority is entrusted with responsibility for both hospital and rural health services. Provinces were expected to implement this reform by 2018, and despite a slow start in the same year, it is gradually being rolled out. The reform aims to enhance the management and coordination of health services at the provincial level, fostering more effective healthcare delivery.

SAM in national health policy and guidelines

The 2018–2022 national Medium-Term Development Plan, 2018–2022 included 'improved nutrition standards' as one of its goals. Subsequently, SAM treatment services have been included in most health policy documents although there are opportunities for further integration in some operational documents.

The latest 2009-2020 PNG Child Health and Policy Plan[23] emphasizes the need to improve health facility and community services for the management of malnutrition, and provision of SAM treatment supplies. The use of MUAC is also now recommended as demonstrated in the last 2016-2018 DHS survey[8].

The malnutrition section of the "Standard Treatment for Common Illnesses of Children in PNG" issued in 2016[24] (10th Edition of the Paediatric Standard Treatment Manual) includes MUAC and an updated treatment section. The 2016 NNP[16] "Policy Statement One" aims to establish a national and provincial multi-sectoral coordinating mechanism to provide leadership and advocacy. This mechanism will ensure that the NNP is sufficiently resourced, implemented, and evaluated effectively, and relevant research is conducted to inform practice.

However, the 2014 integrated management of childhood illness policy and guidance, which was developed before SAM integration was initiated needs updating. It recommends weight-for-age for SAM screening, and MUAC is not mentioned.

In 2021, PNG developed a roadmap for implementing the Global Action Plan (GAP) on child wasting[2]. The GAP roadmap identifies priority actions for the prevention and treatment of SAM across four outcomes to be implemented in eight priority districts, including the Autonomous Region of Bougainville (AROB), Eastern Highlands, Southern Highlands, Western Highlands, Morobe, National Capital District, Hela, and Simbu provinces.

Key health documents that need updating to include SAM services are:

- **The national IMAM guideline would benefit from an operational section,** like the Manual of Operations (2015), part of the National Guidelines on the Management of SAM in the Philippines.
- **Sector performance Annual Report:** While indicator two covers childhood malnutrition in children under 5 years, there is a lack of performance indicators on SAM management (as exists for tuberculosis, malaria etc.)
- **National development plans and economic growth strategies:** Integration of stunting and wasting targets was not available in any new national development plans and economic growth strategies (e.g., the medium term development plan III 2018-2022[25]).

Technical leadership, regulation, and coordination of SAM services

The National Nutrition Policy (NNP) 2016-2026[16] acknowledges that PNG has struggled to make substantial strides in combating malnutrition for over two decades. Central to this struggle has been limited coordination in executing advocacy, planning, budgeting, and overseeing the multi-sectoral response. Inadequate national-level coordination has not only led to a diminishing recognition of malnutrition as a national health concern but has also redirected efforts required to combat issues like stunting, wasting, micronutrient deficiencies, and the emerging problem of overweight and obesity. Moreover, the potential of collaborative multi-sectoral efforts among partners and programs to mobilize funds has not been fully realized.

As per the NNP, nutrition-specific and nutrition-sensitive interventions were not incorporated into Medium-Term District Plans in 2016, and only 8 out of 22 provinces had designated nutrition officers. According to one key informant, in the other provinces the Family Health Services Coordinator is responsible for coordinating provincial nutrition interventions.

At the provincial level, as of 2021, UNICEF provided support to six out of 22 provinces in implementing SAM management programs. This support, combined with new national policy directions, prompted provinces to initiate the restructuring of SAM management teams.

Key informants outlined various challenges related to leadership, regulation, and coordination. One key informant indicated that some provinces lacked a clear strategic direction for SAM management at the provincial and district levels, with many assuming it was the sole responsibility of the NDOH. Provinces were not supported to face challenges in adhering to their annual work plans for nutrition services and often faced funding shortages for planned nutrition activities.

> *As long as the importance of nutrition intervention remains unrecognized, insufficient resource allocation and funding for interventions in this field will persist.*
>
> Key Informant

> *The primary challenge in achieving substantial nutritional improvements is the lack of effective national and sub-national coordination, compounded by limited technical expertise in nutrition within health services, education, and agriculture.*
>
> National Nutrition Policy, 2016-2022

Key informants reported different challenges related to leadership regulation and coordination as "there is often no clear strategic direction for SAM management at provincial and district level. Provinces still think it is the responsibility of the NDOH" and *"Provinces have activity plans for nutrition services in their annual work plans. But they are not adhering to their plans to implement. Likewise, not funding the planned nutrition activities. During mentorship and monitoring visits by UNICEF or NDOH, provinces would not accompany UNICEF/NDOH with the reason of no funding for that activity, even for just one person to move with UNICEF or NDOH staff."*

At provincial level, a key informant stated that the key challenge at the management and leadership level was the non-prioritization of nutrition intervention: *"As long as they do not see the importance of nutrition intervention, they will not reflect the positions in the structure and not making resource and funding allocation to provide intervention in this area."*

Health financing

Summary

The Total Health Expenditure (THE) has increased over the past years reflecting the increased priority accorded to health care and the vision to reach universal health coverage. Nevertheless, total health expenditure as a proportion of gross domestic product has been stagnating and expenditure per capita is significantly lower than regional countries.

External assistance still makes up a significant share of the budget. Delays in releasing funds and insufficient amounts delivered, are compromising the policy of free primary health care (the front-line health facilities are introducing informal fees as a coping strategy).

The lack of sufficient investment at central level with no dedicated budgets for nutrition, and the management of SAM at the local level, are major bottlenecks to the integration of SAM within the health system (key informant interviews). The overreliance on external support for management of SAM was also stated.

Recommendations:

- Continued financial commitment is needed for management of SAM at a central level.
- Local level budgets must be developed and prioritized.
- Implementation and coordination-related funding in provincial annual costed plans need to be strongly promoted (and must systematically include in-service training and costed plans for supportive supervision).

Table 2: Integration level of SAM management in the health system financing function in PNG

Health system financing		Extent
Regular budget-pooled funding	Regular budget from pooled funds with a sector-wide approach covering financing for SAM services	No
Annual costed action plans	Annual costed action plans of the Department of Health covering IMAM interventions	No
Purchasing of SAM treatment services	Service providers payment mechanism for SAM	Partial
Financial risk protection	Availability of financial protection mechanisms to reduce out of pocket payments for SAM treatment services	No

Overall context of the healthy system financing building block

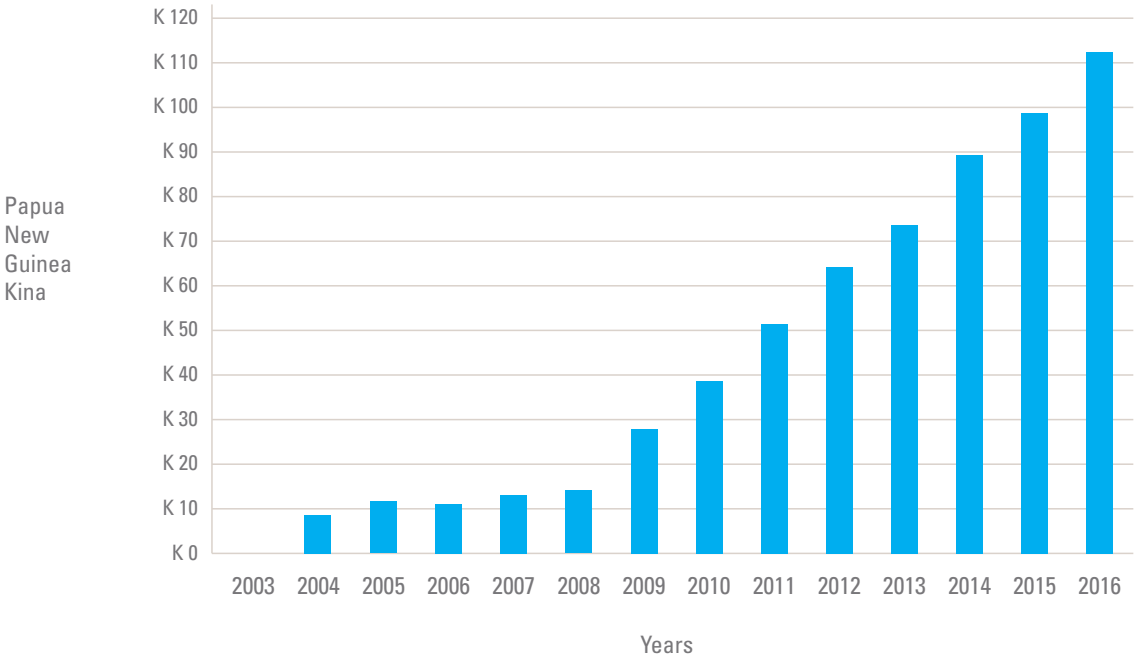
The government is the main financing agent through tax-based financing to both the government and church health services. External assistance plays a significant role in total health expenditure, constituting 20 percent of the funding[12]. Other forms of private investment, engagement from the private sector, and health insurance are comparatively low.

Health expenditure per capita, estimated at US$ 109 (PPP), and the Total Health Expenditure (THE) as a percentage of GDP for health (4 percent) remain notably lower than regional countries[12]. According to WHO, out-of-pocket expenditure on healthcare accounts for just 10 percent of the total health expenditure, possibly due to low service utilization[12] .

In 2012, the PNG government introduced a policy offering free primary healthcare and subsidized specialist care for levels 1 to 3 of the health system. This policy, a key component of the Alotau Accord, subsequently led to the incorporation of a universal health coverage goal in the latest national health policy. However, financing for primary healthcare services remains insufficient.

Decentralization has shifted the responsibility for financing and delivering many public services, including healthcare, to provincial and local-level governments. Nevertheless, a 2016 thesis report[26] on health expenditure tracking and facility survey concluded that the *"health financing system does not reliably fund primary healthcare facilities. Most of them do not receive direct cash funding for their operational expenses, leading them to collect fees or rely on in-kind support. The health function grant is not commonly used for budgeting at the primary healthcare level; instead, it is retained at the provincial and district health offices."*

Figure 4: Increases in the health function grant 2003 - 2016 (Papua New Guinean Kina millions)



Regular budget-pooled funding and annual costed action plan for IMAM

The national department of planning has a budget line for nutrition project management unit in various line ministries beyond health, not all these units have received a budget allocation so far. The aim of this unit is to advocate for each of the sectors to have a nutrition budget to support implementation of the NNP.

For the health sector, nutrition the budget is integrated under primary health care services, and there is no dedicated budget for nutrition interventions.

> *In 2019 Nutrition budget allocation was slightly over PGK 9000.00 (about US$2700.00) for the year and was not enough to sustain nutrition activities at the national level.*
>
> Nation Nutrition Policy, 2016-2026

Key informants reported that the proportion of the health budget made available for nutrition as grossly insufficient to support implementation of nutrition specific interventions under the health sector. Sub-national plans at provincial level have not been costed even in in provinces where nutrition teams have been established[16]. In 2019, for the first time the National Department of Health allocated K500,000 (about US$162,000) for the procurement of nutrition supplies through UNICEF procurement process. However, this budget allocation was discontinued in 2021.

Purchasing/payment mechanisms for service providers

According to WHO Health financing mechanism: Primary health care services are financed through three main ways: funding through budgets or direct payment; in-kind support administered to health facilities (supplies, material, and activities/programmes) and charging fees for services.

Financial risk protection

The policy of free primary health care and subsidized specialist services is compromised at the frontline by local health facilities introducing "informal" fees to address shortfalls in operational funding. These gaps arise from delays in release of funds, bottlenecks experienced in flow of funds to primary care levels and the amount of funding provided.

Service delivery

Summary

SAM treatment services are partially available in six provinces but face quality and availability challenges due to healthcare system bottlenecks. Key challenges impending ability to integrate SAM management into the health system include poor healthcare infrastructure (only 25.7% coverage of essential services) and the absence of functional referral systems at all levels of the health system. Since 2015, important efforts have been made to ensure outpatient and inpatient management of SAM in PNG. Integration remains, nevertheless, slow and challenging. Given these challenges, the rapid nationwide scaling up of SAM treatment is currently considered too ambitious.

Recommendations:

- Increase nutrition training for community-level health workers, ensure regular supervision, and implement systematic child screening to enhance early malnutrition detection in existing provinces.
- Promote community-level awareness of the importance of child health and nutrition services offered at the nearest health facilities.
- Advocate for enhanced provincial coordination and management support for frontline workers as part of the universal health coverage approach.
- Improve the geographical availability of SAM treatment services in the six provinces and implement a phased, realistic scale-up to provinces where it has not yet been introduced, starting with the priority districts identified in the GAP roadmap.

Table 3: Integration level of SAM management into service delivery function in PNG

Service delivery		Extent
Accessibility	Accessibility and availability of SAM services at the lowest level and continuity of care	No
Demand generation and prevention	Community engagement and education on essential child health and nutrition services, and care practices	Partial
Early case finding	Screening for SAM is included in outreach and community health services and systematic case finding by health workers for all children presenting at the health facility	Partial
Community-based primary care	Outpatient management of SAM without complications as part of comprehensive care at health clinic/centre and in community	Partial

Overall context of the service delivery building block

> *Challenges in health service delivery have a big impact on the system's ability to manage SAM effectively.*

Despite increased budget allocations, improvements in health services and outcomes remain limited in many regions[12]. The government's constrained ability to provide healthcare in remote areas is a contributing factor. The 2019 health system review[20] emphasized critical deficiencies in healthcare infrastructure quality and coverage. Consequently, the 2021-2030 National Health Plan (NHP)[27] indicated that a substantial proportion (30-60%) of level 3 and level 4 health facilities required extensive renovation. Rural health services faced challenges, resulting in the closure of 48% of aid posts, despite some investment in 32 community health posts. Aid post closures were driven by health worker shortages, delayed funding, and limited resource availability.

A shortage of qualified health workers continues to impede healthcare coverage, leading to a decline in facility utilization across outpatient attendance, antenatal care, supervised delivery outreach, and immunization coverage. Access to essential health services is currently at a mere 25.7%, primarily due to geographical barriers and limited services at community-level health posts or aid posts, many of which are supported by church health services. Some of these smaller health posts serve over 8,000 people and are staffed by a single Community Health Worker (CHW) or nurse.

The health system review also highlighted a concentration of patients in urban and peri-urban areas, resulting in referral bypass and significantly better access and outpatient contacts for these populations in comparison to rural and remote areas.

Early case detection of children with SAM

In 2018, MUAC measurement was incorporated into the Child Health Book to improve access. In March 2018, SAM treatment protocol guidelines[28] were issued for nurses, community health workers, health extension officers, and doctors. These guidelines emphasized the importance of trained community health workers, village health volunteers, and community members measuring MUAC and checking for bilateral pitting oedema in children aged 6-59 months whenever possible. The community-based approach to managing malnutrition aimed to integrate nutrition care services into existing healthcare services at all levels, including health facility-level services like mobile clinics, foot patrols, and community outreaches, with connections to community activities such as house-to-house gatherings and churches for screening, referral, follow-up, and sensitization services.

> *Outreach for SAM is not really happening but is done for other health services. It is not prioritized due to lack of funds for transport health workers, and few of them are trained on nutrition measurement*
>
> Key Informant

However, challenges were reported, including limited resources (funding) and training for health workers, hindering SAM outreach. Additionally, the majority of the population in PNG lack awareness of essential nutrition services and practices[22]. A 2022 study by Action Against Hunger UK[29] identified gaps in wasting identification and treatment support, particularly for nutritionally at-risk mothers and infants. The study recommended that Community Health Workers (CHWs) could play a significant role in integrating wasting treatment but noted the lack of CHWs in remote areas

and the absence of up-to-date training materials and guidelines. Standardizing community-based mobilization and malnutrition screening, including family MUAC measurement, across all platforms was also suggested. Moreover, key informants for this study suggested that outreach services were not functional.

Accessibility and availability of SAM treatment services

Since 2015, PNG has been striving to provide SAM treatment services in both outpatient and inpatient settings. However, integration is still a challenging task that needs improvement. In 2020, SAM management was implemented in six provinces, and the National Department of Health (NDOH) aims to expand it to all provinces despite feasibility concerns. UNICEF partners with NDOH to advocate for prioritising malnutrition in provinces. It directly supports six provinces in Infant and Young Child Feeding (IYCF) and SAM programs while providing other provinces with supplies, materials, and technical and financial support.

Community mobilization is carried out by village health volunteers, who use MUAC for detection and refer wasting cases to treatment sites. Malnutrition screening at outpatient clinics, such as children's TB and HIV clinics, is recommended25. However, anthropometric measurements are not consistently taken during under-5 health consultations, resulting in fewer reported cases.

> *Outreach for SAM is not really happening but is done for other health services. It is not prioritized due to lack of funds for transport health workers, and few of them are trained on nutrition measurement*
>
> Key Informant

The National Nutrition Policy (NNP)[13] acknowledges that treating wasting is under-resourced in PNG, and there needs to be more clarity about the extent and distribution of the problem in many parts of the country. Many clinic facilities report that the problem is extensive, and cases are frequently under-reported through hospital data collection systems, and the capacity to treat the condition is inadequate. Most key informants have reported challenges with systematically taking anthropometric measurement including to health workers lack of knowledge on how take measurements and a lack of measuring equipment.

Health workforce

Summary

PNG faces significant gaps in the number and distribution of the health workforce, especially at the primary level of care. Key challenges integrating SAM treatment under this pillar include insufficient nutrition training and supervision. Existing healthcare personnel often lack the necessary skills for SAM detection and treatment, and those with expertise are predominantly situated at higher levels of healthcare.

Recommendations moving forward:

- Enhance geographic distribution and training of new health workers
- Integrate SAM management within job descriptions and preservice education curricula modules of all medical and paramedical health workers
- Systematically incorporate SAM management into ongoing professional development with allocated budgets
- Enhance the capabilities of local management teams to effectively coordinate and oversee front-line healthcare workers in SAM management and other essential nutrition services

Table 4: Integration level of SAM management into the health workforce function in PNG

Health workforce		Extent
Adequate coverage	Adequate number of health workers trained on SAM management and their geographic distribution	No
Competences	Job descriptions and work standards for health workers include treatment of SAM	No
Education/ skills development	Modules of pre-service education curricula for all health sector staff include prevention and treatment of SAM	Under development
	In-service training for all untrained health workers providing SAM treatment services	Partial
Performance management and motivation system	Performance appraisal and supportive supervision includes SAM treatment services	Partial
Professional development	The integrated management of acute malnutrition is included as part of continuing professional development for health workers	No

Overall context of the health workforce building block

In 2011, the World Bank released a report highlighting the healthcare workforce crisis[30]. This crisis was marked by an aging workforce, limited preservice training capacity, and insufficient in-service training opportunities. The 2019 Health System Review reaffirmed the severe shortages and uneven distribution of healthcare workers.

PNG boasts a healthcare workforce exceeding 12,000 individuals, encompassing community health workers, health extension officers, midwives, nurses, and doctors[31]. However, the nation faces the lowest staff-to-population ratio in the region, with significant disparities in distribution across various regions. The healthcare worker-to-population ratios have decreased across all disciplines, plummeting from 1.27 per 1,000 population to 0.97 per 1,000 in 2018. The health sector grapples with a 27 percent overall vacancy rate, as preservice training institutions struggle to produce the necessary workforce. Factors contributing to this crisis include underinvestment in public sector training, workforce migration to the private sector or overseas, and an aging workforce.

The National Department of Health (NDOH) oversees nursing schools and colleges that have not yet merged with universities[31]. Community health workforce training is predominantly conducted by churches through their 12 schools, offering a 2-year certificate course. In-service training primarily prioritizes crucial programs like immunization, reproductive health, and communicable disease control. However, it faces challenges, including inadequate teaching capacity, standardization of training programs, duplication of in-service training activities, and the absence of links between in-service training and career progression pathways.

To address these issues, the government has introduced various policies, including standardized training systems, a centralized human resource management system, and the implementation of performance-based management practices.

Adequate coverage and distribution of health workers trained on treatment of SAM

Most of the key informants interviewed during this study listed human resources as one of the top three challenges for SAM integration in PNG.

A review of the nutrition program[22] revealed that the country lacks an adequate number of qualified nutrition specialists. Only 8 out of 22 provinces have a designated nutrition officer, and these officers often lack proper training.

In 2019, a workshop involving all 28 pre-service curricula institutions was conducted to revise teaching modules,

including nutrition content, and incorporate the SAM protocol. This effort aimed to ensure consistent and high-quality nutrition education across all schools.

The National Nutrition Program 2016-2026 (NNP) has an objective to enhance nutrition coordination at both national and provincial levels. However, since the NNP's development, the number of nutrition officers has decreased. Insufficient funding for these positions has led staff to seek better-paying roles elsewhere.

> *Several staff in the nutrition positions have left due to inadequate funding, opting for better-paying roles.*
>
> Key Informant.

Pre-service training: In 2020, the curricula for Diploma General Nursing and Community Health Worker programs were under review, with initial support from UNICEF. The National Department of Health (NDOH) provided comprehensive IMAM and IYCF training to nurse educators, tutors, and healthcare personnel. This training aimed to update their knowledge and skills in these areas, including SAM management. Additionally, members of the Nursing Council and the PNG Medical Board attended these sessions.

While official curriculum updates were still pending, training institutions in PNG had already incorporated the latest nutrition information into their teaching materials at the time of this study.

In-service training: For most of the health workers the two main nutrition components included are the IYCF package and IMAM. In 2020 each of the **6 priority provinces for IMAM received mentorship** and had been trained on IMAM.

SAM in continuous professional development and performance management

Key informants identified a lack of mentoring support and skill development at the health post level as a significant challenge. They noted that while provincial health authorities had been established, there was limited supportive supervision for SAM management. Paediatricians in hospitals provided some support, but reporting consistency was an issue, and provincial offices were not seen as supportive.

Though a few hospitals offered supervision, it was mainly by paediatricians in charge of wards. However provincial offices were not seen as supportive. Provincial health authorities in some provinces, rarely supported outpatient treatment sites. Recently, UNICEF funding initiated supportive supervision, but its sustainability was uncertain due to a lack of prioritization.

In addition to a shortage of trained personnel, key informants stressed inadequate funding for mentoring, ongoing coaching, and effective communication networks as major challenges. The aging workforce further compounded issues, as it hindered learning and mentorship efforts. Trained professionals often assumed different roles, diverting from nutrition services.

> *While paediatricians in some hospitals provide supportive supervision, provincial health authorities generally offer little support to outpatient treatment sites, particularly in focused provinces.*
>
> Key Informant

Health information system

Summary

The health information system lacks adequate nutrition data, negatively impacting planning, and quality of care for SAM. While the integration of MUAC into the NHIS in 2018 was a significant step forward, heavy reliance on UNICEF and partners for SAM reports persists. In provinces where IMAM has been implemented, SAM indicators are collected using parallel systems.

Recommendations

1. Standardize data collection and reporting format for SAM across all the provinces
2. Promote a unified reporting system
3. Improve the completeness and accuracy of SAM reports from health facilities to support decision-making and planning
4. Integrate nutrition data collection into the NHIS

Table 5: Integration level of SAM in the health information system function in PNG

Health information system		Extent
Indicator in health management information system	National health management information system including SAM treatment indicators (and being reported against consistently)	Partial (ongoing inclusion)
Service monitoring	Routine health service assessments and supervision checklist include SAM services.	Partial
Data management	Completeness, timeliness, and accuracy of SAM reports from health facilities providing SAM treatment services.	No
Data use	Data from SAM treatment reports translated into information to inform decision-making/planning for SAM services	No

Overall context of the health information building block

The National Health Information System (NHIS) faces challenges related to lack of integration and perceived compromises in data quality. It encompasses monthly paper-based records from all health centers and public hospitals across the country, primarily focusing on primary healthcare data but also including some basic inpatient discharge counts. The transition to a paper-free system, known as eNHIS, occurred in 2018[32].

According to the 2019 health system review[33], NHIS monthly summary forms consistently achieve a high national completion rate, typically around 90 percent annually. However, maintaining this rate often necessitates additional year-end efforts to collect missing data from various facilities, districts, and provinces.

Data quality concerns arise as the data undergoes review by the national office only when generating the annual sector review report, which can occur many months after data submission. Any necessary corrections are made in the extracted dataset rather than addressing the source data, impacting data integrity and its usability for other organizations or researchers.

While the health center record book has the potential to capture diverse health center data and identify trends, it remains underutilized due to staff's limited training in data utilization and analysis[33].

SAM indicators in the health information system

The 2011-2020 Review and Analysis of Nutrition Program[22] highlighted the inadequacy of the health information management system in nutrition, impacting healthcare planning and care quality. This stemmed from the absence of a comprehensive national administrative reporting package in PNG's NHP 2010-2020 to accurately record and report nutrition services data. Additionally, there was no operational system at the village level healthcare facilities to collect and report nutrition data, primarily due to the absence of relevant indicators in the national health plan.

In 2018, efforts were made to enhance tracking by incorporating MUAC measurements into the NHIS and the Child Health Book kept by parents. The National Nutrition Strategic Action Plan (2018-2022), aligned with PNG's Medium-Term Development Goals (2018-2022) and the Multi-Sectoral National Nutrition Policy (2016-2026), also considered appropriate tracking methods.

Furthermore, six out of the 22 provinces incorporated integrated Severe Acute Malnutrition (SAM) management, utilizing MUAC for identifying children for treatment, into their annual work plans. Some funding was allocated to facilitate integrated program monitoring.

SAM indicators and reporting

The NDOH continues to rely on UNICEF and its partners for SAM reports.

In 2020, the NDOH-Nutrition Section continued to utilize the Excel database created by UNICEF for recording IMAM data. This standalone NDOH-UNICEF database complements the NHIS and captures admissions and discharges, calculating cure, death, and defaulter rates. However, it only collects data from implementing facilities, not all provinces and districts.

Before 2018, the NHIS did not emphasize nutrition indicators. Although there have been some improvements, it currently includes only MUAC and z-scores, lacking other crucial nutrition indicators such as cure and defaulter rates.

Key informants have raised concerns about the quality of the reports, including data accuracy, duplication, insufficient disaggregation, and uneven eNHIS coverage:

- "The quality of data remains a challenge, with some health workers struggling to fill monthly nutrition forms correctly. Mentorship visits are attempted to address this, but challenges persist."
- "UNICEF provides support when report analysis is delayed, but the database itself needs revisions to enhance user-friendliness."
- "Duplication occurs, particularly when reports are sent to both UNICEF and NDOH, leading to redundant data entry."
- "In 2020, there's a transition towards using the Kobo system in a few selected provinces, where health facilities will collect and send data to UNICEF electronically through smartphones, tablets, and computers, alongside the paper-based report forms."

Medical products, vaccines, and technologies

Summary

The medical supply chain faces interruptions to stock levels of essential medications due to lack of funds and supplies at the facility level. Notably, in 2019, ready-to-use therapeutic foods, therapeutic milk, and ReSoMal were included in the National DOH's Medical and Dental Catalogue, 11th edition. Additionally, the NDOH allocated a budget line for the procurement of nutrition items in the same year. Infant scales and MUAC tapes are also now included. However, there is still a strong dependence on UNICEF support to provide these products.

Recommendations moving forward:

- Enhance the national supply chain system, with a focus on procurement, to ensure consistent availability and effective tracking of treatment supplies
- Decentralize budget allocation for SAM management to local governments, mitigating current budget constraints and minimizing stock-outs and delayed deliveries at healthcare facilities
- Advocate for a gradual increase in the central-level nutrition budget line for supplies in alignment with the IMAM scale-up plan

Table 6: Integration level of SAM in the medical products function in PNG

Medical products, vaccines, and technologies		Extent
Essential medical supplies list	National essential drugs and medical supplies list including SAM management supplies, including RUTF, therapeutic milk and anthropometric equipment	Full
Procurement and distribution system	National drugs and medical supply needs forecasting and procurement covering SAM management are forecasted, procured, and delivered through national supply chain system	Partial (Stockouts are common)
Stock monitoring	RUTF and other supplies for treatment of SAM are included within the national Logistics Management Information System	No

Overall context of the medical supplies building block

At national level, each program is responsible for quantifying its medical and related needs and formulating a distribution plan. This plan relies on consumption data and disease patterns. Most items in the catalogue are procured through the NDOH's Medical Supplies Procurement and Distribution Branch, which initiates the process through tender and quotation advertisements. Pharmaceutical companies submit bids, and contracts are awarded before importation and delivery to one of four regional Area Medical Stores covering the 22 provinces: Port Moresby for the Southern region, Lae for the Momase region, Mt. Hagen for the Highlands region, and iRabaul for the Islands region. Subsequently, privately contracted companies, commissioned by the government, transport the NDOH's medicines and related supplies from these Area Medical Stores to healthcare facilities.

Nonetheless, the medical supply chain faces significant challenges in terms of supply chain management, distribution, cost, and infrastructure. Specific challenges identified by this study include:

1. **Supply Chain Interruptions:** The recent 2021-2030 National Health Policy has noted persistent interruptions in the supply of essential medications. This has resulted in many facilities often running out of basic drugs. For example, the primary treatment drug for malaria is present in only 59% of the level 3 and level 4 public health facilities, indicating a gap in the distribution.
2. **Centralized Oversight:** The government has the primary responsibility for procuring all drugs and supplies, which are then distributed throughout the public healthcare system. However, this centralized control has encountered challenges, leading to inefficiencies in the supply chain.
3. **Operational Funds and Supply Constraints:** Studies point to a significant lack of operational funds and medical supplies at individual facility levels, which has been a major barrier to efficient service delivery.
4. **Declining Availability:** Over the past decade, there has been a noticeable decline in the availability of common drugs and medical supplies[34]. This has been compounded by the nearly doubled procurement costs of these items from 2010 to 2014[35].
5. **Distribution and Infrastructure Challenges:** The 2019 health system review[33] underscored considerable challenges in the distribution and maintenance of medical and diagnostic equipment. Furthermore, the necessary communication infrastructure that supports an efficient distribution system remains problematic. The distribution of pharmaceuticals has been a recurring challenge for the health sector over the years. This issue manifests in stockouts, delayed deliveries, and other distribution inefficiencies.

SAM supplies in Essential Medical Supplies list

In 2019, RUTF, therapeutic milks and ReSoMal were included for the first time in PNG NDOH's Medical and Dental Catalogue, 11th edition. Other nutrition equipment's were also introduced such as MUAC tapes and infant scales.

> *We received the supplies at approximately half of the health facilities. In some provinces supplies remained in storage warehouses for a long time*
>
> Key Informant

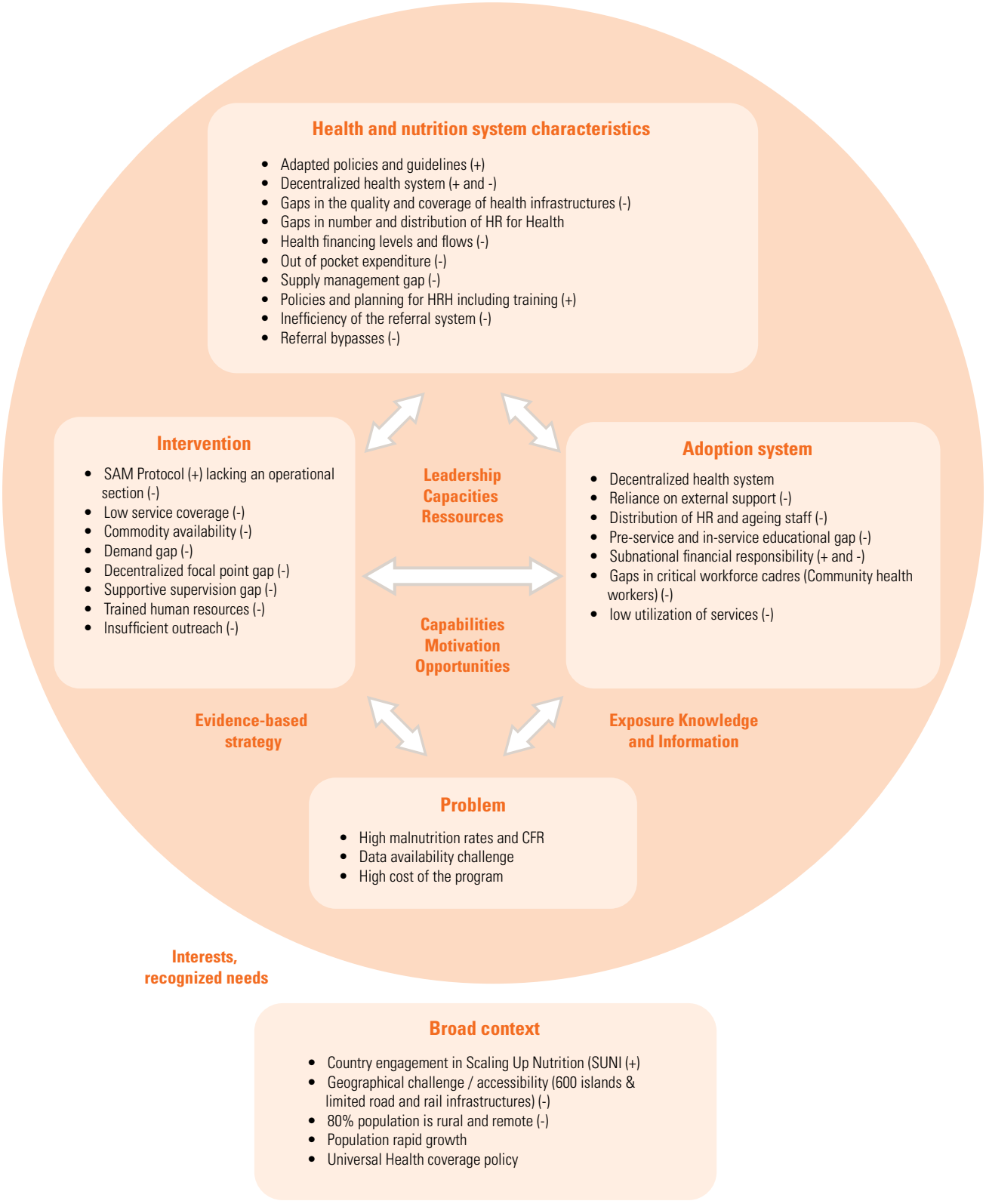
Procurement and distribution of SAM supplies

Key informants highlighted significant challenges in the procurement and distribution of SAM supplies, with a heavy reliance on UNICEF for support. In many instances, only about half of the health facilities received the necessary supplies.

In 2019, for the first time, NDOH made its first order for nutrition supplies. These supplies were expected to arrive in early 2020, though they did not include emergency provisions. However, the incoming supplies were insufficient to cover the needs for the first half of the year. Consequently, NDOH needed to plan for an additional order in early 2020.

> *The government presently lacks the financial capacity to procure supplies for both development and humanitarian programs, there is thus a continued need for UNICEF support.*
>
> Key Informant

Figure 5: Summary of system analysis for integration of SAM into the health system in PNG



CONCLUSION

Since 2014, the collaborative efforts of the NDOH and UNICEF have resulted in significant strides towards integrating SAM services into PNG's health system. Although SAM management has been extended to six provinces, several substantial challenges persist.

Many of the factors impeding the integration of SAM services are rooted in broader structural weaknesses within the healthcare system. A substantial portion of the obstacles outlined in this report are not specific to SAM management but rather reflects systemic issues, including:

1. **Service Delivery:** Challenges such as low service coverage, infrastructure gaps, underutilization of services, and the absence of a referral system affect the entire healthcare delivery system.
2. **Human Resources:** The scarcity and uneven distribution of healthcare staff, as well as the aging workforce, impact not only SAM management but the entire healthcare workforce.
3. **Supply Chains:** Budgetary constraints and frequent stockouts of essential medical supplies including Ready-to-Use Therapeutic Food (RUTF) affect various healthcare programs.
4. **Health Information System:** Fragmented data collection practices hinder comprehensive healthcare planning.
5. **Financing:** Overreliance on external support and inadequate provincial-level budget planning affect all healthcare programs.

In addition to these systemic challenges, there are specific hindrances to the SAM management program that require targeted actions, including:

- **Enhancing Financing:** Full integration of SAM supplies into NDOH budgets and a sustained financial commitment to SAM management at both central and local levels are essential.
- **Community Outreach and Demand Generation**: Efforts to increase awareness and demand for SAM services within communities need to be intensified.
- **Prioritizing Training:** Comprehensive training for healthcare personnel in SAM management, encompassing both pre-service and in-service training is imperative.
- **Improving RUTF Supply:** Ensuring a consistent and adequate supply of RUTF is vital.

Moving ahead, it is essential to recognize the substantial progress made in integrating SAM services into PNG's healthcare system. While challenges persist, the momentum generated by the joint efforts of the NDOH and UNICEF holds great promise.

Looking ahead, we must remain committed to expanding our reach to underserved regions and communities. By developing a strategic scaling-up plan and nurturing unwavering political leadership at all levels of government, we can build upon our achievements.

A prudent scaling-up strategy, coupled with sustained political leadership at all levels of government will be crucial in ensuring the continued success in integrating treatment services to become part of routine health services in PNG.

Annex 1: Documents consulted during the literature review.

PNG Official Documents:

- Medium Term Development Plan III (2018-2022)
- PNG Development Strategic Plan DSP (2010-2030)
- Sector performance annual review (2019)
- PNG National Nutrition Policy (2016-2026)
- PNG National Nutrition strategic action plan (2018-2022
- Standard Treatment for Common Illnesses of Children in PNG- a Manual for nurses, community health workers, health extension officers and doctor's 10th Edition (2016)
- PNG Child health strategic implementation plan (2009-2020)
- PNG National Health Plan (2011–2020)
- PNG School health Policy (2015)
- PNG –WHO Country Cooperation Strategy (2016–2020)
- Policy Research Working Paper 7301 Stagnant Stunting Rate Despite Rapid Economic Growth in PNG Factors Correlated with Malnutrition among Children under Five –World Bank Group.
- SAM- A guideline to the treatment protocol For Nurses, Community Health Workers, Health Extension Officers, and Doctors in PNG-2018
- PNG Household Income and expenditure survey (2009-2010)

Reports/ Working documents.

- Independent State of PNG Health System Review-Health Systems in Transition Vol. 9 No. 1 (2019)
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- Review & Analysis of Nutrition Programme-2011-2020 for Drafting the National Health Plan (2021-2030) Wilson Karoke Nutrition Unit (May 2019)
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- PNG Scaling Up Nutrition Report (2019 and 2021)
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- SHORT CHANGED: The Human and Economic Cost of child undernutrition in PNG- Save the children (2017)
- Abstract: Integrating nutrition supplies (including Ready to Use Therapeutic Food) into PNG's Medical and Dental catalogue, procurement, and distribution UNICEF (2019)
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- Public Expenditure, Decentralisation and Service Delivery in PNG: Tracking Budgets to Health Clinics Colin Wiltshire Thesis (2016)

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Annex 2: Key informant interviews and questionnaires

Seven key informants responded and sent back completed questionnaires. Of the seven key informants who responded to the written questionnaire, four subsequently underwent an oral interview. Four key informants responded to the questionnaire at national level and three at provincial level.

Profile of the respondent

1. **Ms. Eileen Dogimab:** NDOH - National Capital District. Technical Adviser Nutrition and Dietetics.
2. **Camilla M. Blasius:** Nutrition Officer UNICEF PNG.
3. **Hanifa Namusoke:** Former nutrition specialist UNICEF PNG.
4. **Representative of Western Highlands Province** (based in hospital)
5. **Representative of National Capital District** (at provincial office and travels to outpatient clinics in the national capital district)
6. **Representative of Autonomous Region of Bougainville** (at the provincial office)
7. **Representative of Susu Mama non-governmental organization** – Western Highlands Province (at head office but does visits to other provinces they are operating in)

Two different questionnaires were developed, one for the central level, one for the provincial level.

PNG SAM integration in the health system- questionnaire

1. **Global questions:**
    a. What are the recent improvements in global health services delivery in PNG?
    b. Was the NHP evaluated (since it will be ending in 2020)?
    c. Who are the champions for nutrition in country (partners/ donors…)?
    d. Who are the champions for SAM in country (in the health authorities/ partners/ donors)?
2. **Wasting specific questions**
    a. History of wasting in PNG (short summary of key recent achievement/ steps taken and number of provinces covered)
    b. Geographical priorities for further roll out SAM management.
    c. Key current improvements noticed and bottlenecks (per health system building block) for detection and treatment of wasting in PNG.
3. **Questions per Building block of the health system**
    a. Governance:
        i. Where does the nutrition team sit in the Department of Health?
        ii. At provincial level who oversees the nutrition interventions delivered through the health package and more particularly of SAM detection and management coordination?
        iii. At district level (same question)
        iv. In a decentralized model what were the key challenges faced when rolling out SAM management in the country?

b. Financing:
    i. In 2019, was there a Department of Health budget line dedicated to nutrition? (Percentage of the main basket?)/ was there a budget line for SAM detection and management/ was there a budget line for the equipment and supplies. If yes, what amount for what activities?
    ii. In 2020, do we know what the provisional budget for nutrition / for SAM detection and management/ for equipment and supplies will be. If yes, what amount covers what activities? If nothing sure, do we have estimates? Is there a budget associated with nutrition commodities.

c. Health information system
    i. Describe the mechanisms implemented and how it is integrated or not to the general HIS
    ii. What of the quality of the data collected?
    iii. When are the data collected and transferred who does the analysis?
    iv. What are the challenges?

d. Service delivery
    i. Do we know if anthropometric measurements are systematically taken during a <5 years health consultation?
    ii. How is SAM treatment delivered? (As part of any medical consultation or via specific moments and days?) How is it integrated in the continuum of care?
    iii. Emergency preparedness: is there a national/ provincial emergency preparation plan including wasting management? (Nutrition response and recovery plan)
    iv. Has Integrated Community Case Management+ SAM approach been envisaged in PNG?
    v. Is the cured rate globally collected and analysed?

e. Human resources
    i. The NNP has set an objective towards improving Nutrition coordination at national and provincial level. I seem 8/22 provinces had a nutrition officer at the time of the NNP development, has it improved? Does it play a role in facilitating wasting management rollout?
    ii. Training programme: has in-services training on SAM detection and management benefited to the 22 provinces?
    iii. Health curricula (pre-service training): what are the steps of integrating SAM in the curricula?
    iv. In the prioritized provinces do the health authorities provide supportive supervision including SAM management?

f. Supply drugs
    i. Is the material (scale, MUAC tapes etc) well delivered in most health centres in the country? Is it supplied via partners or by the Department of Health?
    ii. Did you experience stock out of nutritional commodities in 2018-2019?
    iii. How were in 2019 the nutrition products (therapeutic milks, RUTF and others) purchased and distributed?
    iv. What is the plan for 2020 (budget and distribution)?

PNG SAM integration in the health system REVIEW- Provincial questionnaire

1. **Presentation**

What is your position, role and experience in health and nutrition?

2. **Global questions**

   a. **History of wasting management in your province** (short summary of the integration of SAM management in your province and key recent achievement)

   b. **Key challenges and bottlenecks encountered for SAM integration into the health system** in your province.

3. **Questions per building block of the health system**

   a. Governance:
      i. At provincial level who oversees the nutrition interventions delivered through the health package and more particularly of SAM detection and management coordination?
      ii. At district level (same question)
      iii. What are the challenges for the nutrition services to be integrate in the primary health care setting?

   b. Financing:
      i. What are the challenges met at provincial and district level in terms of budget? Is there a dedicated budget for nutrition interventions?

   c. Health information system:
      i. Describe the mechanisms implemented at provincial level for nutrition data collection and how it is integrated to the general HIS
      ii. What if the quality of the data collected
      iii. When are the data collected and transferred who does the analysis?
      iv. What are the challenges?

   d. Service delivery:
      i. Are anthropometric measurements taken systematically during a <5 years health consultation?
      ii. How is SAM treatment integrated in the continuum of care?
      iii. Is the cured rate globally collected and analysed?

   e. Human resources:
      i. Is there a nutrition officer in your province? Do they play a role in facilitating wasting management rollout?
      ii. Training programme: has your province benefited from in-service training in nutrition and more particularly SAM management?
      iii. Could you estimate the percentage of human resources trained in SAM management in your area of work?
      iv. Do you provide supportive supervision including SAM management?
      v. What are the challenges in terms of human resource follow up for SAM management?

   f. Supply drugs
      i. Is the material (scale, MUAC tapes etc) well delivered in most health centres in your province? is it supplied via partners or by the Department of Health?
      ii. Did you experience stock out of nutritional commodities in 2018-2019?
      iii. How were the nutrition products (therapeutic milks, RUTF and others) distributed in 2019?
      iv. What is the plan for 2020 (budget and distribution)?

Annex 3: Indicators and framework for assessing level of integration of severe wasting into the health system.

1. **Deconinck's diagnosis tool (adapted): the extent of SAM Integration in the health system (2015)** The key health functions examined are listed in the table below.

Health system building blocks		Extent
Governance		
Policy setting	National health and nutrition policies with SAM as part of comprehensive child health care* (i.e., IMCI and child hospital care)	
National guidelines	National guidelines for IMCI and child hospital care supporting comprehensive child health care	
Technical leadership	Technical advisory group for comprehensive child health care	
Regulation and coordination	Regulation and coordination of health actors aligning with national health and nutrition policy and implementation strategy	
Evidence-based decision-making	Generation and interpretation of intelligence and research on policy and strategy options	
Social participation	Social participation of local and community actors in planning, building coalitions and implementing and monitoring comprehensive child health care with a people-centred approach	
Contingency planning	Plans and regulations for addressing contingencies	
Financing		
Regular budget-pooled funding	Regular budget from pooled funds with a sector-wide approach covering financing for comprehensive child health care	
Annual costed action plans	Annual costed action plans for comprehensive child health care	
Health workers payroll	Staff in national health facilities involved in comprehensive child health care on Ministry of Health payroll	
Financial risk protection	Fee waiver system for children (or health insurance) under 5 covering comprehensive child health care	
Information		
Health information (HIS)	National HIS including indicators for comprehensive child health care	
Service monitoring	Performance monitoring of comprehensive child health care	
Contact coverage monitoring	Coverage monitoring of comprehensive child health care	

Health system building blocks		Extent
Workforce		
Adequate coverage	Adequate number and spread of qualified health workers for comprehensive child health care	
Competences	Adequate technical and organizational management skills for comprehensive child health care	
Performance and motivation	Performance appraisal and career development opportunities for comprehensive child health care	
Pre-service education	Pre-service education modules on comprehensive child health and nutrition	
Professional development	Continuing professional development on comprehensive child health and nutrition	
Supplies		
Essential medical supplies list	National essential drugs and medical supplies list covering comprehensive child health care	
Procurement system	National drugs and medical supplies needs (forecasting and) procurement covering comprehensive child health care	
Logistic management system	National logistic management system for drugs and medical supplies covering comprehensive child health care	
Service delivery		
Demand generation	Demand generation for informing communities, changing health behaviour, and improving health service access and utilization	
Early case finding	Active case finding of selected child illnesses by volunteers in community and systematic case finding by health workers at the health facility	
Community-based primary care	Promotive and preventive community-based health and nutrition activities and community case management (CCM)	
Facility-based primary care	Decentralized comprehensive child centred IMCI	
Child hospital care	Comprehensive child-centred paediatric hospital care	
Health outreach	Health outreach activities for immunization and other comprehensive child health care and nutrition services	
Referral and tracing system	Referral and tracing system between services for service uptake and retention in treatment of comprehensive child health care	
Patient-centred continuity of care	Comprehensive child health care tracked over time and place responding to individual preferences, needs and values	
Quality improvement	Continuous quality improvement of comprehensive child health care	

2. **The Atun Framework36 (2010): Factors influencing integration**
   The conceptual framework structures **factors that influence the integration of a new intervention into a national health system.** The author defines integration as the extent, pattern, and rate of adoption and eventual assimilation of health interventions into each of the critical functions of a health system. An 'intervention' in this context refers to combinations of technologies (e.g., vaccines, drugs), inputs into service delivery, organizational changes and modifications in processes related to decision-making, planning, and service delivery. Atun et al, suggest that the adoption and diffusion of new health interventions and the extent to which they are integrated into critical health system functions will be influenced by **the nature of the problem being addressed, the intervention, the adoption system,** the **health system characteristics,** and **the broad context.** Promoting factors are marked (+), hindering factors (-), both promoting and hindering factors (+ -).

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