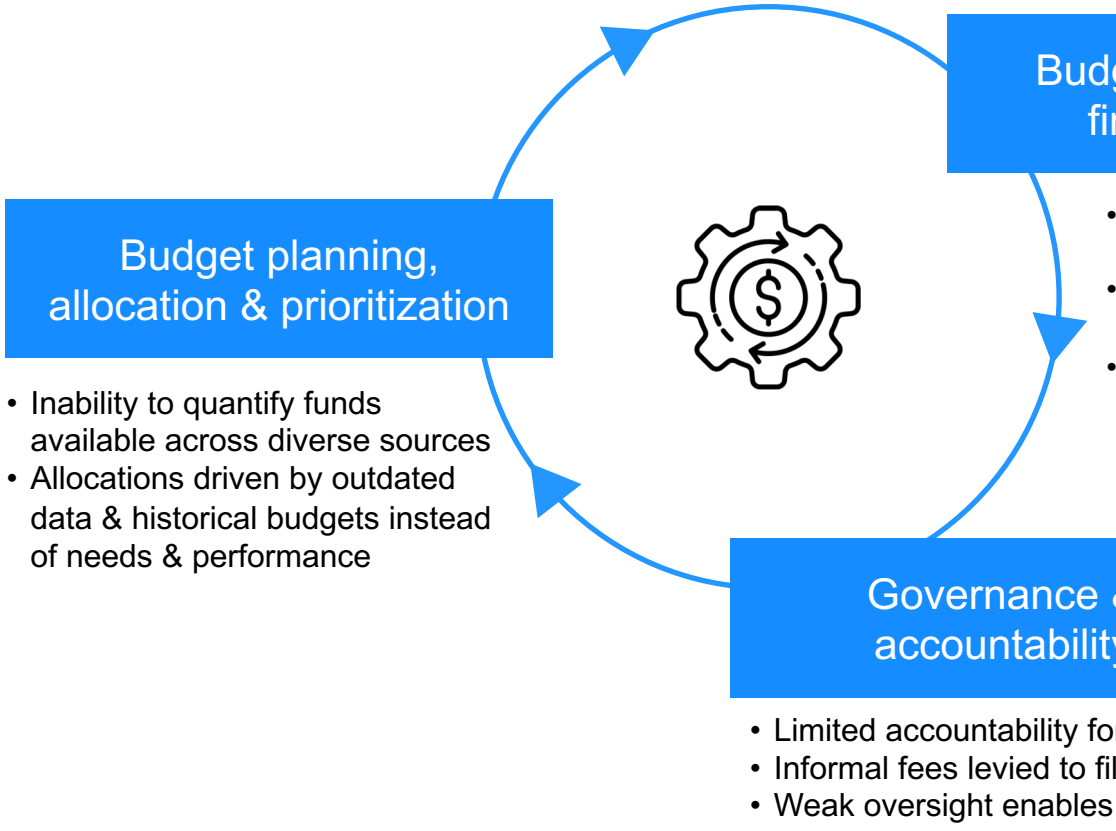
# Executive Summary: Digital Public Infrastructure Approaches to Strengthen Public Financial Management in Health

April 2026

# Executive summary (1/6)

## PFM challenges can impact health service delivery outcomes

### Common PFM challenges




- Delays & unpredictability disrupt facility operations
- Chronic underspend due to complex processes
- Fragmented reporting across funding sources

- Inability to quantify funds available across diverse sources
- Allocations driven by outdated data & historical budgets instead of needs & performance

- Limited accountability for outcomes
- Informal fees levied to fill funding gaps
- Weak oversight enables ghost workers

### Health service delivery impacts

- Essential medicine **stockouts**
- **Unpaid** health workers
- **Non-functional** equipment
- Unfunded **operational costs**
- Patients pay **out-of-pocket**

# Executive summary (2/6)

## These PFM challenges are often caused by fragmented data and amplified by structural constraints

**Manifestations**

### Information bottlenecks

- **Limited standardization**, inability to link expenditures to health results
- **Redundant** data capture, no single source of truth
- Data **incomplete or untimely**
- **Low trust** in data

### PFM challenges
(incl. resource bottlenecks)

- **Budget planning, allocation, & prioritization** misaligned with needs
- **Budget execution & financial flow bottlenecks** causing funding delays
- Gaps in **governance & accountability**

### Health service delivery

- Essential medicine **stockouts**
- **Unpaid** health workers
- **Non-functional** equipment
- Unfunded **operational costs**
- Patients pay **out-of-pocket**

**Structural, political constraints**

**Digital readiness, e.g.,**

- Legacy system limitations
- Internet connectivity gaps
- Lack of data standards, registries
- Analog payment infrastructure

**PFM structural rigidities, e.g.,**

- Inflexible reallocation rules
- Complex request processes
- Limited local autonomy
- Revenue collection challenges

**Underlying factors, e.g.,**

- Baseline workforce capacity
- Geographic disparities
- Health system structure and service design

Governance across levels, politics & incentives, fiscal space, donor dependence, state capacity

# Executive summary (3/6)

## A Digital Public Infrastructure (DPI) approach could help address these challenges

Like roads and railways, DPI helps to connect people, data, and money to enable public services and economic activity.

### Foundational DPI Components

DPI components are foundational and **shared digital systems** built for public benefit.

**Registries & Identities**
Unified, unique identification for people, facilities, and resources

**Payment Systems**
Standardized transaction infrastructure with audit trails

**Data Exchange**
Secure, interoperable information sharing protocols and platforms

**Emerging**
Recognized foundational DPI components continue to expand
*(e.g., consent frameworks, digital credentials, digital signatures).*

### DPI Design Principles

DPI approach's **design principles** ensure that DPI serves everyone, enables innovation, & evolves with changing needs.

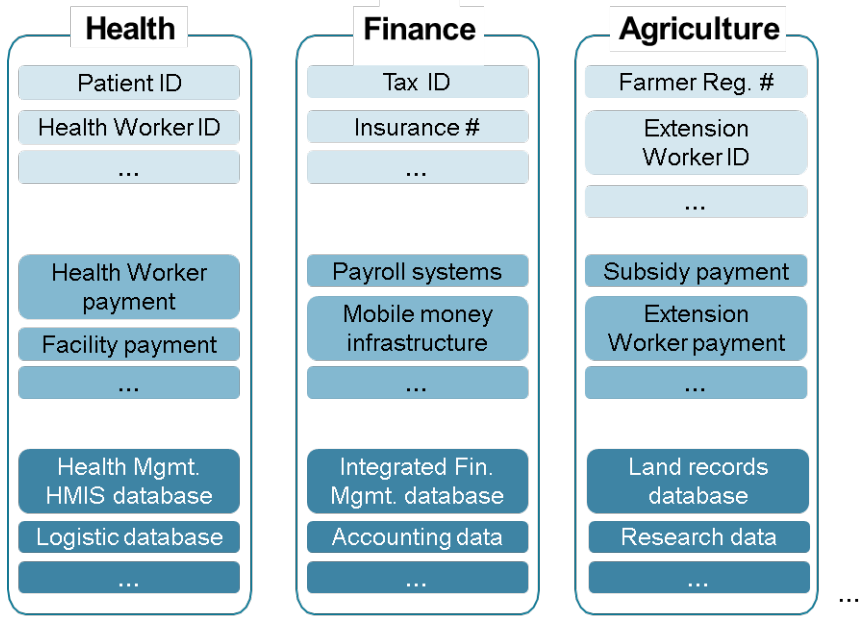
| | |
|---|---|
| 1 | **Interoperability** *Standard formats and protocols allowing different systems to connect and work together* |
| 2 | **Minimal & re-usable building blocks** *Core functions built once and used across multiple services* |
| 3 | **Enables innovation** *Open design and standards that allows many organizations to create new solutions* |
| 4 | **Federated & decentralized** *Data stays with its owner while still being securely accessible* |
| 5 | **Security & privacy by design** *Systems incorporate safeguards, consent, and access controls as core features* |

# Executive summary (4/6)

## A DPI approach establishes reusable building blocks used across functions

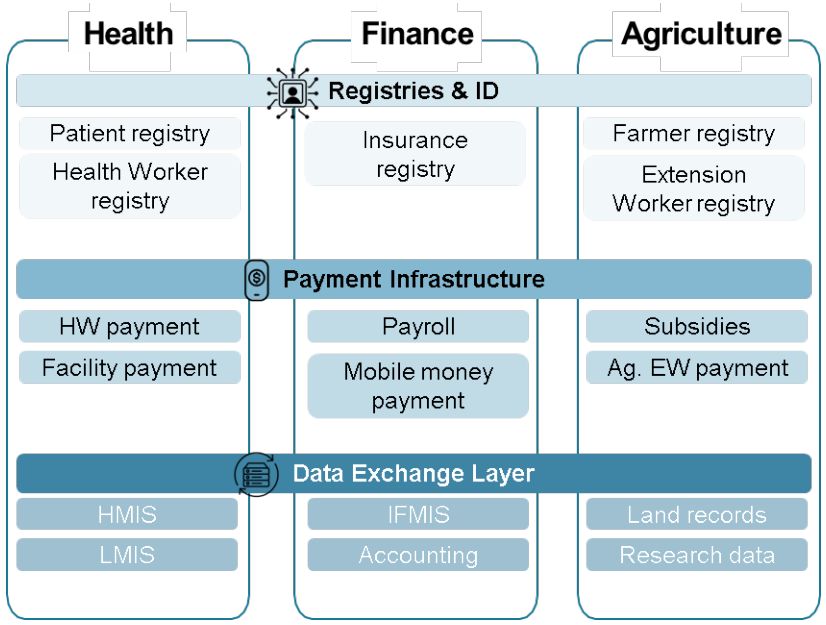
### Traditional approach

Function-specific systems with limited integration across sectors




### DPI approach

Standard, reusable building blocks used across functions and sectors




**DPI saves time and cost, and unlocks intersectoral value**

1. **Implementation efficiency**: Faster deployment, streamlined maintenance
2. **Lower cost**: DPI approach centers on reusable capabilities serving multiple functions
3. **Cross-sectoral value**: Enables exchange of data for planning, execution

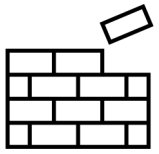
# Executive summary (5/6)

## Case studies show evidence and potential for DPI approaches to address common PFM challenges

| Common PFM challenges | Opportunities |
|---|---|
| **Delayed community health worker payments**<br>CHWs face payment delays due to incomplete data, manual verification of work and identities, and complex, multi-level fund approval processes. | **Employment Scheme Payments in India**<br>Odisha, India faced similar challenges with an urban employment scheme that left 43% of allocated funds unspent. MUKTA/iFIX enabled by **shared registries, data exchange, and digital payments** allowed for interoperability across IFMIS and work verification systems to achieve 92% reduction in payment disbursement time for urban day labourers. |
| **Delayed reimbursements challenge service delivery**<br>In many countries, insurance or free care schemes offer free or subsidized essential services at point of care, which facilities may use to pay for medicines.<br><br>Inefficiencies in claims verification and slow fund transfer processes delay reimbursements to facilities, leading to essential medicine stock-outs. | **Improving Timely Funding from Free Care Scheme in Burkina Faso**<br>In Burkina Faso, Gratuité (covering key services for women and children under 5) makes up 50% of health facility revenues, but inconsistent and delayed payments can affect service continuity—in a context where nearly 88% of health facilities in the country had drug shortages in 2023. The MOH is aiming to connect facility-level financial mgmt., billing, and stock mgmt. data through a standardized master facility list (**digital registry**) and **data exchange**, to prioritize allocations to health facilities to reduce stock-outs and ensure equitable cash flows. |
| **Poor/inequitable resource allocation**<br>Fragmented data systems with unstandardized data hinders timely visibility and analytics; meaning districts and facilities cannot make regular (re)allocation decisions for efficient, equitable budget execution. | **Data Exchange to Reduce Underspend in Ethiopia**<br>In Ethiopia, key donor grants and government funds go unspent while essential services are unavailable at facility level. The MOH and MOF are standardizing data attributes across systems through **shared registries** and streamline data entry, which will allow for **data exchange** and unified visibility over budget execution across levels, to reduce underspend. |

# Executive summary (6/6)

## Close consideration of enabling capacity, governance, and resources is critical to success of DPI approaches



**DPI is not a panacea, and not always the answer.** DPI approaches may address specific bottlenecks in information and resource flows, but they cannot resolve insufficient funding, restrictive legal frameworks, or fundamental state capacity constraints. **Digital tools should always be one piece of an approach;** with concurrent attention to **policy, institutional, and financing factors** beyond digital infrastructure.

**A lifecycle approach to software development strengthens the delivery of DPI approaches**

### SOUND PLANNING AND GROUNDWORK

Critical preparatory work to:

- Focus on clear use case with high **govt priority**
- Understand **country readiness for DPI,** assess **existing strategies**
- Ensure **cross-ministry governance**

### EFFECTIVE SOFTWARE DEVELOPMENT

Software dev/upgrade:

- Consider **existing digital public goods** and what exists in-country
- Move from waterfall to **agile methodologies** involving **end users**
- Build for sustainability and **scalability** from the start

### SUSTAINABLE TECHNOLOGY ROLLOUT, UPTAKE, AND INSTITUTIONALIZATION

Throughout rollout process:

- Enable **cross-sectoral deployment**
- Prioritize end users, **change management**, and adoption of tech
- Ensure it is **context-specific**
- Update the **enabling environment**

Ensure sustainability:

- Iteratively **improve** and drive **progressive gains**
- Establish **cross-cutting** govt teams, **transition** to domestic support and maintenance
- Establish **governance and legal frameworks** for DPI

# Digital Public Infrastructure Approaches to Strengthen Public Financial Management in Health

April 2026

# Index

# Objectives and methodology

# This report uses case studies and literature to show how DPI approaches can address common PFM challenges in the health sector in LMICs

Leverage experiences of **ministries** and **health systems** in **low- and middle-income countries (LMICs)** to:

Describe common **public financial management (PFM)** challenges in **health** and their effects on **service delivery**

Illustrate how **digital public infrastructure (DPI)** approaches can address these PFM challenges for the **health sector** and beyond

This report presents the practical experiences of governments and health systems, while drawing on established frameworks, reports, and guidance. It does not intend to reproduce these tools or create new frameworks. It also focuses on the effects of PFM challenges on service delivery; as such, examples arose primarily related to the budget cycle and fewer on more distal (but equally important) functions such as revenue-raising. See Annexes for recommended frameworks and literature.

# This report uses case studies and literature to show how DPI approaches can address common PFM challenges in the health sector in LMICs

## Who is this report for?

### Government stakeholders

- Ministries of Health, Finance, and ICT

### Technical partners

- Implementers and advisors supporting PFM and digital systems

### Funders and development partners

## How might this report be used?

### Inform national strategies

- Align PFM and digital investments with health system priorities and service delivery goals
- Provide a foundation for thoughtful, long-term planning

### Guide investment decisions

- Identify opportunities to strengthen core systems (e.g., financial management, data platforms)
- Help prioritize foundational approaches over fragmented, one-off solutions
- Guide investment in DPI-aligned global goods that address PFM gaps in the health sector

### Support intersectional dialogues

- Enable collaboration between stakeholders working on health, finance, and ICT sectors
- Create a shared language and framework to tackle cross-cutting challenges

# The report draws from experiences across government, implementation and technical partners, and funders

### Literature Review

High-level desk-based literature review of existing reports in PFM, health financing, and DPI

### Country Team Consultations

Information gathering from CHAI teams in 2 countries in Asia and 12 countries in Africa

### Country Deep Dives

Field visits and interviews in 3 countries, and additional consults in 4 other countries

### Key Informant Interviews

Discussion with technical partners (Public Digital, Centre for DPI, OpenIMIS)

### Modular Presentation

Preparation of modular presentation for diverse audiences (funders, technical partners, governments)

### Partner Reviews

Feedback from funders (Co-Develop, World Bank/GFF), technical partners (ODI/Cabri, OpenIMIS, VitalWave, Dimagi, OpenFN), UN (WHO, UNICEF)

### Final Report

Circulate presentation and case studies (conferences, blog posts, etc.)

# Country Team Consultations: CHAI country teams in fourteen countries were consulted to develop a bottom-up approach to this study

## Consultations with in-country teams

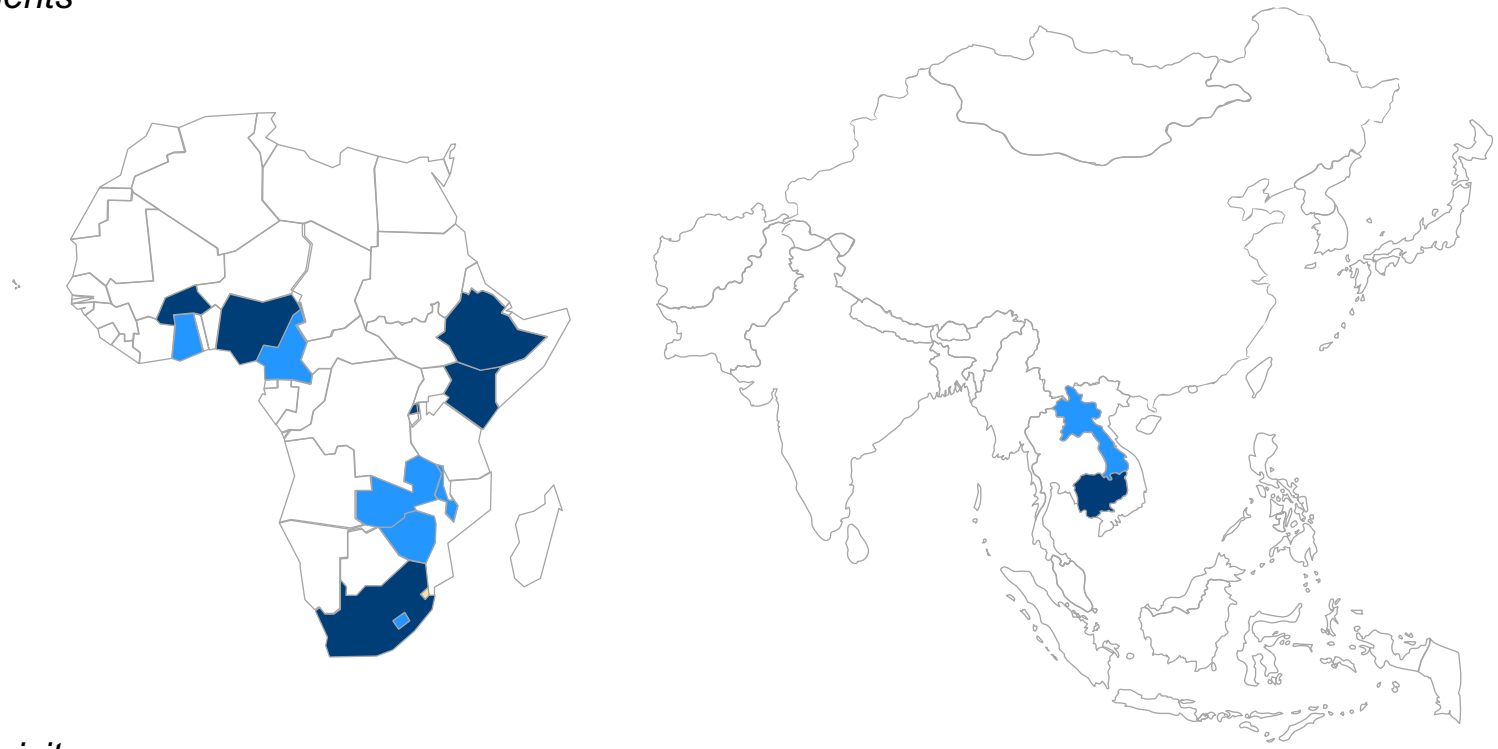
*Discussions with financing and digital health teams in the following 14 countries, which are supporting governments on health PFM and digitization efforts*

Asia:

- Cambodia
- Laos

Africa:

- Burkina Faso
- Cameroon
- Eswatini
- Ethiopia
- Ghana
- Kenya
- Malawi
- Nigeria
- Rwanda
- South Africa
- Zambia
- Zimbabwe



## Deep dives in prioritized countries

*Of these, follow-on deep dives through government consultations, document reviews, and select country visits were conducted in 7 countries (next slide)*

# Country Deep Dives: further consultations and document reviews in eight countries provided depth and substantiation for the report

| | Burkina Faso | Cambodia | Ethiopia | India** | Kenya | Nigeria | Rwanda | South Africa |
|---|---|---|---|---|---|---|---|---|
| Enabling environment | • Early DPIs underway (incl. health)<br>• Commitment to digital health reforms, with strong digital teams working across govt<br>• Weak PFM* | • Advanced, MOF-led DPI efforts; payments/ banking system enabling financial inclusion<br>• Natl digital health strategy & dept of digital health in place<br>• Moderate PFM* | • DPI reforms priority for govt<br>• Robust digital health platforms; variable digital maturity across regions<br>• Moderate PFM* | • Leader in DPI (ID, payments, exchange)<br>• Strong digital maturity; Advanced digital health stack & integration architecture; Moderate implementation<br>• Relatively strong PFM* | • Strong mobile payments, ID & other DPI underway<br>• Digital Health Superhighway sets out future vision for interop.<br>• Relatively strong PFM* | • DPIs exist though often at state level<br>• Vision for digital health reforms incl. EMR at PHC; variable digital maturity<br>• Weak PFM, though variable across states* | • Leader in digital trans. & DPI adoption in Africa<br>• Digital health reforms high govt priority<br>• Robust PFM* | • DPI efforts underway<br>• Draft digital health strategy; strong infrastructure & several nationally scaled digital systems<br>• Robust PFM* & finance teams at Treasury & MOH |
| Challenges & opportunities | • Stock-outs due to unpredictable Gratuité payments<br>• Delayed CHW payments | • Delayed claims disbursement for HFs<br>• MOF-led efforts toward UHC | • Lack of visibility on financial & service data<br>• Under-utilization & poor liquidation of program funds<br>• Poor visibility for planning | • Delayed payments to urban day workers<br>• Under-utilization of program funds | • Inability to link health & finance indicators for allocation, mgmt.<br>• Facility autonomy & UHC reforms underway | • Delayed or missed BHCPF transfers to PHC level<br>• Delayed insurance payments, low enrollment, high OOP | • Unclear benefits for high-cost services can lead to delay or refusal of care | • Inequities & inefficiency in staffing, commodity shortages, maintenance given lack of granular data<br>• Opaque tender processes |

*Notes*: *PFM ranking from last available PEFA scores (see Annex; less than 0.5= weak; between 0.5 and 0.6 = moderate; between 0.6 and 0.7 = relatively strong; above 0.7 = robust); ** India case study developed through previous work done by eGov, separate deep dive not completed

# Public financial management (PFM) in health

## The challenge

# Public Financial Management has the potential to enable health service delivery

## PFM objectives: Governance of processes across sectors

**Aggregate fiscal discipline.** Effective control of budget, management of financial risks.

**Strategic allocation of resources.** Planning & executing budget in line with government priorities & policies.

**Efficient service delivery.** Achieving the best levels of public services with the resources available.

## Budget cycle: Three phases of the annual cycle; with fiscal space affected by larger macro-fiscal context

**Macro-fiscal context and revenue-raising**

### Formulation

Set priorities; allocate resources

Develop spending plans based on policy objectives

### Execution

Implement approved budgets

Process payments, manage cash flow, track spending vs. budgets

### Monitoring

Audit & evaluate performance

## Implications: A responsive and well-implemented PFM system can enable health service delivery[1]

Ensures adequate funds for the health sector (across programs and levels), based on needs and resources available

Ensures healthcare providers are paid on time, adequate drugs are procured, spending is efficient and in line with needs

Enables robust evaluation and monitoring of budgets to inform future allocations

Note: (1) While the evidence base is inconclusive, a well-implemented PFM system with a responsive structure can be an enabler of service delivery. Existing frameworks and tools explore how PFM can support strong, efficient service delivery

# However in practice, PFM structures and operations can often contribute to health service delivery challenges

## Common bottlenecks to health service delivery can be linked to the flow of resources.

*Delays and unpredictability of resource flows can be a result of PFM rules and/or how PFM is implemented. For example...*

| PFM challenges (incl. resource bottlenecks) | Health service delivery |
|---|---|
| **Delayed funds** due to fragmented & manual processes for verification, approval, payment | **Community health workers** not paid in full or on time, impacting motivation, attendance |
| **Debt build-up** at facility and higher levels, **delayed payments** to suppliers, **complex drug procurement** processes | **Essential medicine stock-outs** and expiries |
| **Delayed approvals & transfers** of reimbursements for services delivered; facilities lack sufficient funds | **Patients charged informal fees** to fill funding gaps |

# Fragmentation and complexities in health financing, alongside PFM's aims of compliance, can cause frictions across the budget cycle

**Basic PFM aims**[1]

- **Credible budget** with high execution
- **Compliance and control** of public spending
- Comprehensive and timely **accounting and financial reporting**

**Health financing realities**

- **Multiple resource controllers operate simultaneously**
- **Non-financial resources** contribute to service delivery but never enter financial system
- Resources flow through **multiple channels**; **needs** can be **unpredictable**
- **Purpose-specific allocations** & accounting structures
- **Variable purchasing mechanisms** by inputs & services

**Implications across budget cycle**

**Formulation**

- **Disparate budgets** by health system level, line item, channel without coordination
- Budget **inaccuracies** from fragmentation

**Execution**

- PFM rules & systems can be **inflexible**—hinders strategic purchasing, local autonomy, procurement to respond to changing needs

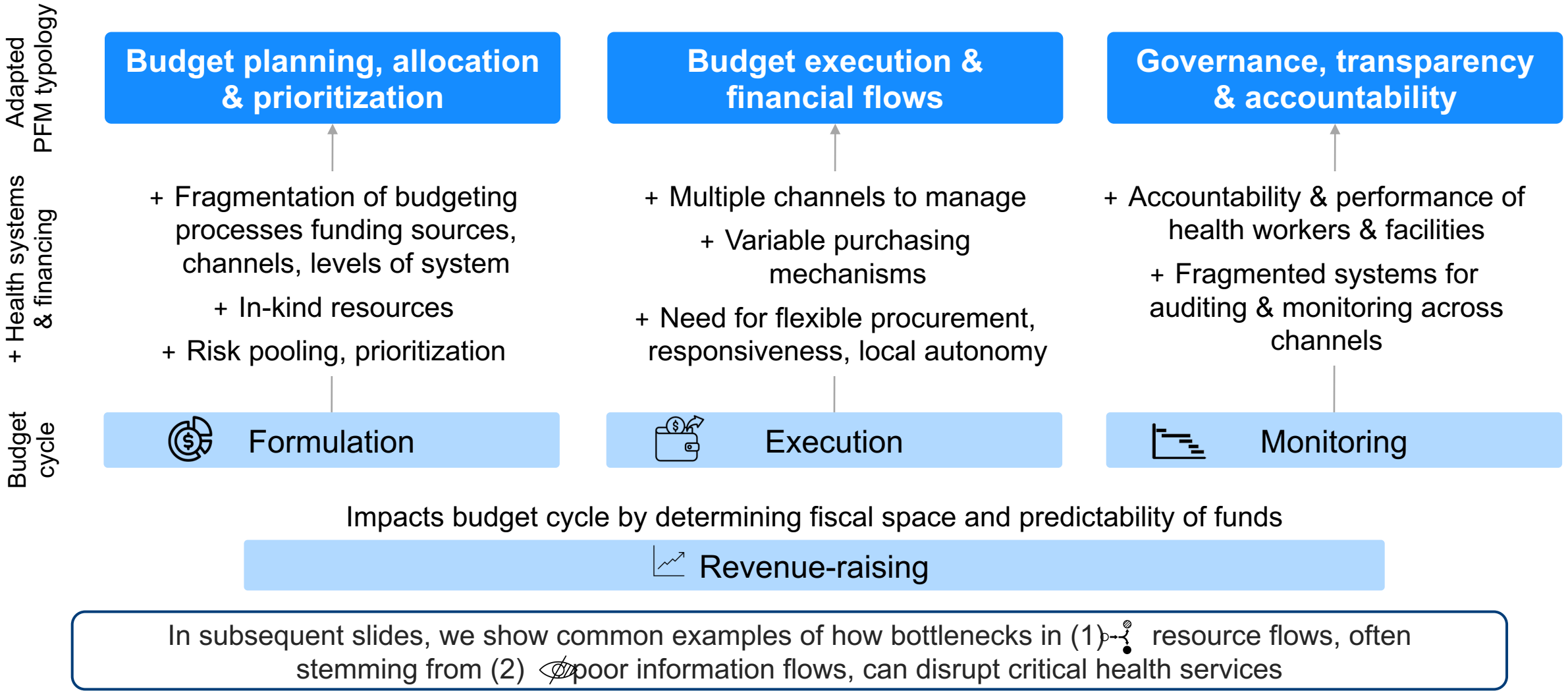
**Monitoring**

- Parallel systems & fragmentation **weakens auditing & monitoring**

These frictions can create bottlenecks in (1) resource flows and often (2) information that impair health services

*Note:* (1) Basic PFM Aims adapted from: Hadley, S., & Allen, R. (2025). *Back to the Basics of PFM in Contemporary Issues & Challenges in Public Financial Management: Responding to Global Crises;* additional sources in Annex

# An adapted PFM typology encompasses the interplay between health financing and PFM, to situate the case examples from our scoping




*Note: Framework adapted to pinpoint PFM-specific bottlenecks that more directly impact health service delivery. Revenue-raising has an important effect on fiscal space, which can be impacted by poor transparency and predictability of revenues. However, it has a more indirect link to service delivery so issues around revenue did not often arise strongly in case studies*

# Common resource bottlenecks can disrupt service delivery and widen inequities (1/2)

## Budget planning, allocation & prioritization

- **Low coverage of subsidies and schemes** meant to cover the vulnerable, leading to continually high out-of-pocket spend
- **Inequitable allocations** based on historical budgetary data instead of current needs
- **Resource constraints** limit needs-based allocation of funding
- **Inaccurate budget forecasts** lead to disbursement delays and budget adjustments

## Budget execution & financial flows

- **Limited facility spend autonomy,** so resources and disbursements are delayed and unresponsive to local needs
- **Delayed, unpredictable funding flows** to subnat'l level, facilities, suppliers, and workers, hindering execution and service availability
- **Complex fund request and procurement processes** leading to delays, unresponsiveness to needs, and contributing to underspend and debt

## Governance, transparency & accountability

- **Low visibility over user fees/revenues** collected at facilities and **resource allocations** at subnational levels
- **Informal user fees** are charged at facility level to fill gaps left by delayed or insufficient transfers and payments
- **Weak oversight over service inputs** (workers, drugs), leading to wastage of funds on ghost workers and pilferage of drugs

These thematic challenges emerged through this scoping, where we focused on effects of PFM bottlenecks on health service delivery. For a more comprehensive view, including e.g., critical functions like revenue-raising which did not arise in the scoping, please refer to existing frameworks and tools.

# Common resource bottlenecks can disrupt service delivery and widen inequities (2/2)

## Budget planning, allocation & prioritization

- **Low insurance/subsidy coverage**
  e.g. insurance coverage remains low in **Nigeria** due to cumbersome enrolment processes and low demand
- **Inequitable allocations**
  e.g. in ***South Africa***, updated data is unavailable so historical data is used for budgeting, which widens geographic health inequities[1]
- **Resource constraints** limit needs-based allocation
  e.g. in ***Nigeria***, local governments often determine allocations based on availability of funds, not facility needs
- **Inaccurate budget forecasts**
  e.g. districts in debt in ***Malawi*** because of delayed payments from Treasury due to inaccurate revenue forecasts

## Budget execution & financial flows

- **Limited facility spend autonomy**
  e.g. in ***Malawi,*** a burnt-out light bulb can shut maternity wards for months while awaiting district approval for replacement
- **Delayed, unpredictable flows**
  e.g. in ***Burkina Faso***, facilities can experience delays and unpredictability in reimbursements from Gratuité, which can create operational constraints and affect continuity of care
- **Complex fund request and procurement processes**
  e.g. in ***South Africa,*** procurement lead times are >400 days vs. the 90-day target, which impacts needs-based supply of consumables, hospital services, and maintenance

## Governance, transparency & accountability

- Low visibility over **user fees and subnational revenues and allocations**
  e.g. in **Ethiopia**, federal level does not have clear visibility over regional and district-level allocations to health
- **Informal user fees** are charged to fill funding gaps
  e.g. in ***Sub-Saharan Africa*** informal payments are prevalent incl. for drugs meant to be free; in part due to low healthcare worker salaries and weak accountability
- **Weak oversight over service inputs** (workers, drugs)
  e.g. ***Tanzania*** removed 10,000+ ghost workers with biometric verification, saving ~USD 2M monthly (2016)

*Notes: Selected case examples are further elaborated in case studies; (1) South Africa: By creating a self-reinforcing cycle: areas underserved continue receiving inadequate funds; well-funded areas maintain advantage; the gap widens each cycle; Sources in Annex*

# Information bottlenecks often contribute to PFM challenges, exacerbating health service delivery challenges

## The flow of information generally determines the flow of resources.

*Lack of trusted and timely data, as well as current systems' inability to link financing and service data, can often constrain resource flows. For example...*

| Information bottlenecks | PFM challenges (incl. resource bottlenecks) | Health service delivery |
|---|---|---|
| **Lack of trusted data on CHW identities and activities**, necessitating multi-step verification | **Delayed funds** due to fragmented & manual processes for verification, approval, payment | **Community health workers** not paid on time, impacting motivation, attendance |
| **Poor data on drug utilization & finances**, to help forecast, allocate, & distribute funds & drugs | **Debt build-up** at facility and higher levels, **delayed payments** to suppliers, **complex drug procurement** processes | **Essential medicine stock-outs** and expiries |
| **Lack of trusted & verifiable data on services delivered** triggers multiple rounds of approval | **Delayed approvals & transfers** of reimbursements for services delivered; facilities lack sufficient funds | **Patients charged informal fees** to fill funding gaps |

# Information bottlenecks impair visibility and decision-making, hindering effective resource flows (1/2)

## Budget planning, allocation & prioritization

- **Budget inaccuracies** because of poor revenue forecasting and unpredictable donor allocations
- **Delayed, aggregated spending data** hinders data-driven budgeting
- **Limited visibility across funding sources** (external, domestic, etc.) to conduct comprehensive budgeting and planning
- **Inability to accurately forecast supply requirements** given limitations in drug utilization data from facilities, fragmentation across funding sources, in-kind supplies

## Budget execution & financial flows

- **Fragmented, diverse reporting requirements** for different sources of funds or schemes can delay flow of funds
- **Disconnected transaction records** for different types of health inputs, hindering tracking of what funds have been spent on and what is remaining
- **No real-time & granular visibility on utilization** to make regular expenditure mgmt. decisions for effective execution

## Governance, transparency & accountability

- **Fragmented performance data**, incl. inability to connect service delivery and financial data for accountability and efficiency
- **Inability to verify service delivery** in a timely manner, leading to delayed payments or ineffective verification
- **Weak oversight over payments and transactions**, such as to health workers or out-of-pocket spend for drugs/services, leading to leakage or informal fees; and reducing government revenues

These thematic challenges emerged through this scoping and are not comprehensive—rather, they are meant to illustrate how information bottlenecks can affect financing flows.

# Information bottlenecks impair visibility and decision-making, hindering effective resource flows (2/2)

## Budget planning, allocation & prioritization

- **Budget inaccuracies**
  e.g. provisional allocations in ***Malawi*** based on over-estimated revenues
- **Delayed, aggregated spending** data hinders budgeting
  e.g. expenditure data often captured by line item instead of program budget, making it difficult to estimate spend by program for future budgeting
- **Limited visibility across sources**
  e.g. ***Ethiopia's*** MoF lacks complete data on funds flowing directly to health entities, which create parallel planning processes
- **Inability to forecast supply requirements**
  e.g. in ***Cameroon***, where there is a mismatch between government forecast and local usage

## Budget execution & financial flows

- **Fragmented reporting requirements**
  e.g. in ***Nigeria,*** where facilities have to retire multiple sources of funds (Federal, State, LGA, donors)
- Disconnected transaction records
  e.g. logistics and accounting systems in ***South Africa*** use different master facility lists, requiring manual data entry and analysis
- No real-time & granular visibility on utilization
  e.g. siloed accounting software and grant mgmt. tools in ***Ethiopia*** hinders timely visibility and contributes to underspend

## Governance, transparency & accountability

- **Fragmented performance data,** incl. financial and service
  e.g. in ***Kenya***, health service delivery and financial data are not connected for future allocation decisions and oversight of funds
- **Inability to verify service delivery**
  e.g. in ***Burkina Faso***, where CHW payments are delayed until service audits can be done
- **Weak oversight over payments and transactions**
  e.g. US cut funding to ***Zambia*** over allegations of systematic theft and resale of donor-funded drugs

*Notes: Selected case examples are further elaborated in case studies; Sources in Annex*

# PFM challenges across the budget cycle can create compound effects on resource flows for health service delivery

## Compounding PFM challenges

Untimely data to prioritize allocations delays fund release, e.g. ***Burkina Faso***: avg. 3-month payment delays

Budget execution & financial flows

Implementation failures lead to stricter controls, e.g. ***Nigeria***: low trust triggered complex verification procedures

Budget planning, allocation & prioritization

Governance & accountability

Poor accountability & low data granularity prevents data-driven planning, e.g. ***South Africa*** expenditure is not attributed to service units

**Full cycle effect**

**$100M+**

in overdue receivables by MoH in ***Ethiopia*** in 2022/23 *(MoH accounts for 42% of overdue receivables across govt)*

Breaking this cycle requires interventions that address multiple failure points *simultaneously*

*Note: Illustrative examples only; not exhaustive*
*Sources in Annex*

# Traditional digitization efforts are not designed to resolve the disconnect between PFM systems and health service delivery

The main tool for digitization of PFM has been proprietary Integrated Financial Management Information Systems (IFMIS), which are digital solutions that automate PFM processes and integrate government PFM functions.

PFM systems

| Design misalignment | System fragmentation | Data limitations |
|---|---|---|
| • Tools targeted for needs of Finance ministry/agencies, often not for service delivery<br>• Focused on tracking inputs rather than outcomes | • Siloed health & finance systems<br>• PFM modules for different functions lack integration<br>• Inconsistent charts of accounts between budgeting & execution<br>• Multiple systems capture similar data in different formats | • Missing facility-level transactions<br>• Data aggregated before entry, losing detail<br>• Redundant data entry with no "single source of truth"<br>• Historical vs. real-time visibility |

Health services

Data dead end: financial information needed for health service delivery trapped in disconnected systems, not available, or lacks adequate disaggregation

e.g. *Ethiopia*: health facilities use disconnected systems for government and donor funds, and service delivery metrics, making it difficult to connect financial and programmatic data for reporting and management

*Sources in Annex*

# In summary, information bottlenecks, PFM challenges, and structural constraints reinforce each other to affect health service delivery

**Manifestations**

| Information bottlenecks | PFM challenges (incl. resource bottlenecks) | Health service delivery |
|---|---|---|
| • **Limited standardization**, inability to link expenditures to health results<br>• **Redundant** data capture, no single source of truth<br>• Data **incomplete or untimely**<br>• **Low trust** in data | • **Misaligned budget planning, allocation, and prioritization,** not driven by needs or evidence<br>• **Budget execution and financial flow bottlenecks** causing funding delays<br>• Gaps in **governance and accountability** | • Essential medicine **stockouts**<br>• **Unpaid h**ealth workers<br>• **Non-functional** equipment<br>• Unfunded **operational costs**<br>• Patients pay **out-of-pocket** |

**Structural, political constraints**

| Digital readiness, e.g., | PFM structural rigidities, e.g., | Underlying factors, e.g., |
|---|---|---|
| • Legacy system limitations<br>• Internet connectivity gaps<br>• Lack of data standards, registries<br>• Analog payment infrastructure | • Inflexible reallocation rules<br>• Complex request processes<br>• Limited local autonomy<br>• Revenue collection challenges | • Baseline workforce capacity<br>• Geographic disparities<br>• Health system structure and service design |

Governance across levels, politics & incentives, fiscal space, donor dependence, state capacity

# Digital public infrastructure (DPI) for PFM

## Potential solutions

# Digital Public Infrastructure (DPI) creates a digital backbone that allows governments, businesses, and citizens to interact efficiently

Like roads and railways, DPI creates integrated networks that facilitates government service delivery and enables private sector innovation. DPI approaches combine foundational **components** (what to build) with architectural **principles** (how to build them)

DPI approaches

**DPI components: The foundational "what"**

Foundational and shared digital systems built for public benefit. Digital services can be built upon these, to deliver social services effectively and securely. Currently there are **three established components**, though this set continues to expand (e.g., consent frameworks, digital credentials, digital signatures)

| | *Purpose* | *Example* |
|---|---|---|
| **Digital registries and ID** | Uniquely identify people, entities, and objects in a digital ecosystem, providing a "single source of truth" | India's Aadhaar digital ID system cost USD 1.5B to implement but saved USD 42B through reduced fraud and leakage in benefit programs |
| **Payment systems** | Enable secure and efficient electronic financial transactions | Brazil's *Pix* connects 900+ financial institutions serving 153M users (70% of population) with instant 24/7 payments |
| **Data exchange** | Facilitate secure, controlled sharing of information while maintaining data ownership and privacy | Estonia's *X-Road* connects 450+ organizations and powers 3,000+ digital services |

DPI principles: The architectural "how"

*Sources in Annex*

# Digital Public Infrastructure (DPI) creates a digital backbone that allows governments, businesses, and citizens to interact efficiently

Like roads and railways, DPI creates integrated networks that facilitates government service delivery and enables private sector innovation. DPI approaches combine foundational **components** (what to build) with architectural **principles** (how to build them)

DPI components: The foundational “what”

**DPI approaches**

**DPI principles: The architectural “how”**

Design principles that ensure DPI serves everyone, enables innovation, and evolves with changing needs. By implementing these principles, already built minimal solutions may be used many times in various contexts by integrations to existing systems.

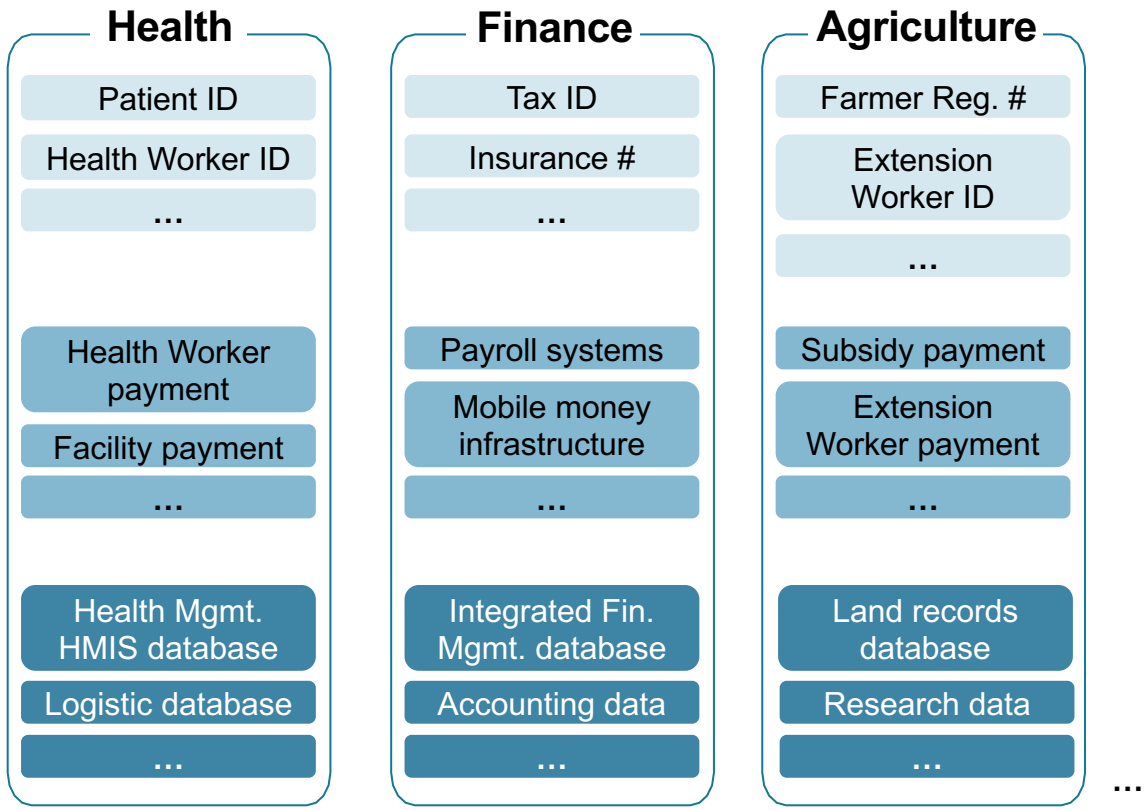
1. **Interoperability.** Standard formats and protocols allowing different systems to work together. Systems use open standards and common interfaces to connect without custom integration. Like shipping containers that work across transportation systems
2. **Minimal & re-usable building blocks:** Core functions built once and used across multiple services. Focus on essential capabilities that can be combined in different ways. Like LEGO blocks creating many structures
3. **Enables innovation.** Open design that allows many organizations to create new solutions. Public specifications and APIs allow diverse organizations to build compatible services. Like electricity standards that let anyone create new devices
4. **Federated & decentralized.** Data stays with its owner while still being securely accessible. Like staying in your home while connecting to the world through roads and mobile communications
5. **Security & privacy by design.** Protection measures built from the start, not added later. Systems incorporate safeguards, consent, and access controls as core features. Like building a house with security systems, not adding them after theft

*Sources in Annex*

# A DPI approach establishes reusable building blocks used across functions, unlike traditional siloed approaches to digitization

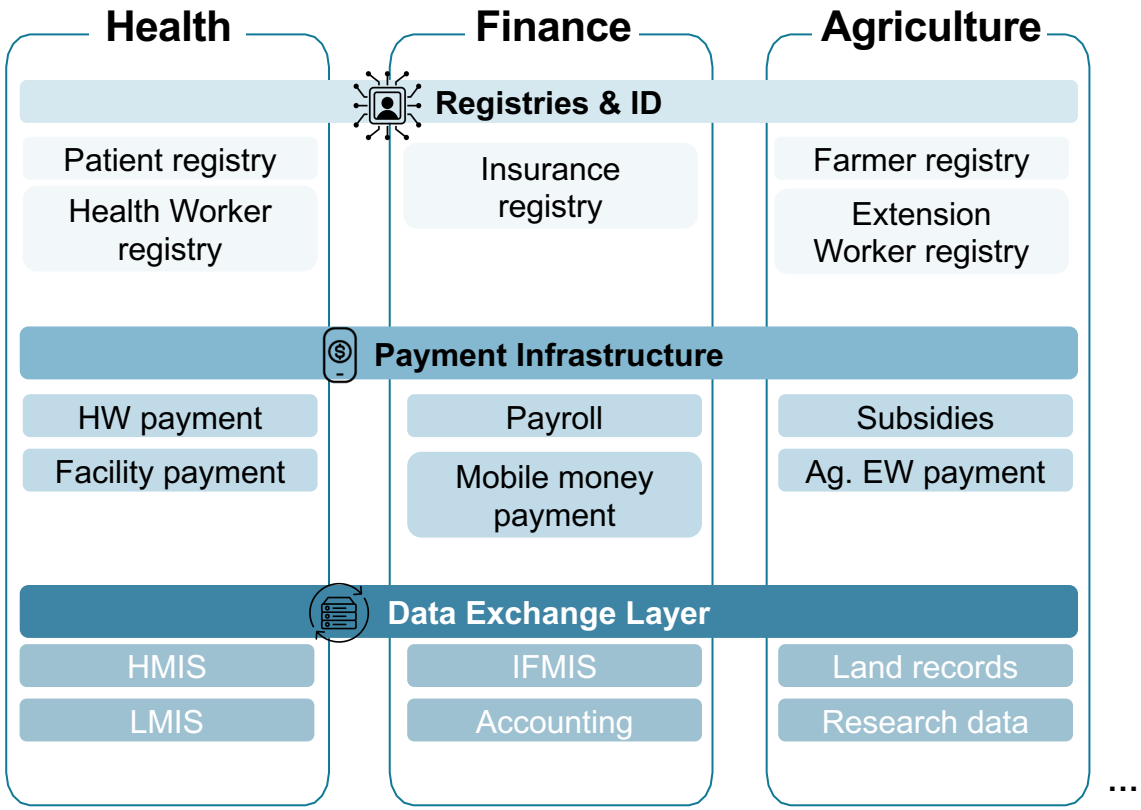
## Traditional approach

Function-specific systems with limited integration across sectors




## DPI approach

Standard, reusable building blocks used across functions and sectors




*Sources in Annex*

# The DPI approach saves time and cost, and unlocks intersectoral value through shared, reusable building blocks

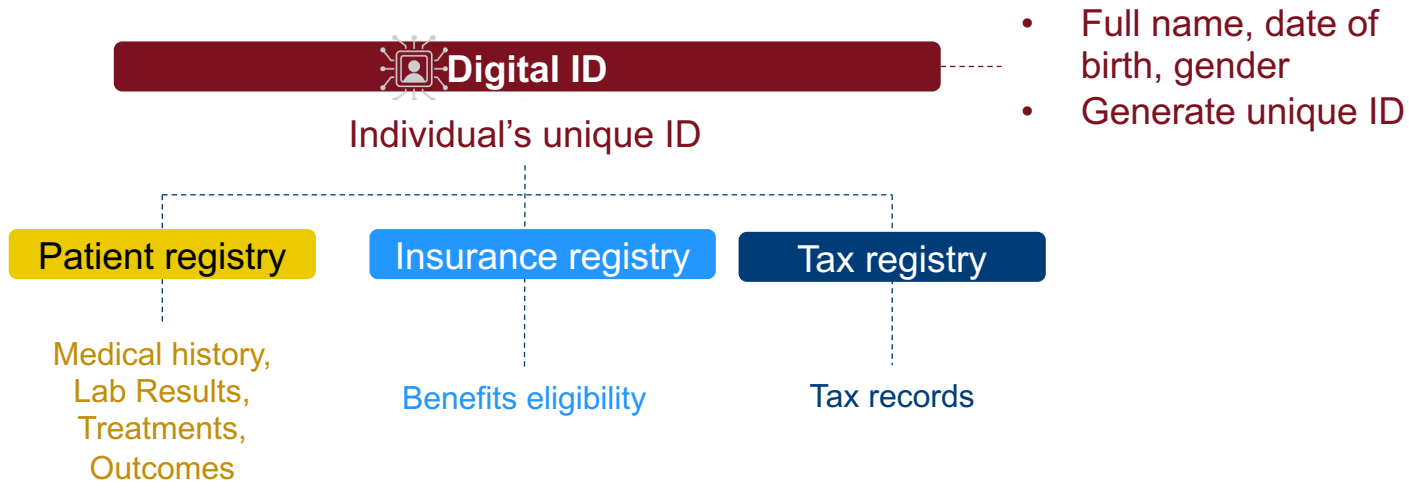
## Key benefits of the DPI approach:

- Implementation efficiency: Faster deployment and simplified maintenance with common set of DPIs.
- Lower cost: DPI approach centers on reusability; one set of core capabilities serves multiple functions, eliminating redundant development of similar platforms across sectors and hence reducing resource needs for digitization
- Cross-sectoral value: Enables easy exchange of data across sectors for planning and execution.

## For instance, benefits of Digital ID:

Information is only collected and stored once and can be securely accessed (with relevant privacy permissions) across other sectors.

In this example, an individual's name, date of birth, and gender are linked to their unique ID, and other registries/entities can securely access and update this information, without needing to collect it again.




*Sources in Annex*

# DPI components have the potential to transform health PFM processes

Examples of how DPI components[1] can resolve bottlenecks across PFM cycle:

| DPI components | Budget planning, allocation, and prioritization | Budget execution and financial flows | Governance, transparency, and accountability | **Key examples** |
|---|---|---|---|---|
|  Registries & IDs | Eliminates duplicate facility & ID records; enables accurate resource needs assessment | Verifies authentic service providers for faster payment processing; enables granular monitoring of spend by facility | Removes ghost health workers; tracks workforce deployment | In **Nigeria**, biometric verification identified and removed 23,846 ghost workers from govt payrolls, enabling monthly savings of USD 11.5M. **Ethiopia**'s Master Facility Registry integrated 21,000+ health facilities, enabling better resource allocation across use cases |
|  Payment systems | Links verified transactions to service delivery data for evidence-based allocation | Accelerates CHW payments and supplier reimbursements; reduces transaction costs | Creates traceable payment audit trails, verified drug purchases and patient interactions; prevents unauthorized fees | Across **20+ countries**, WHO has moved polio campaign worker payments from slow cash disbursements to direct Mobile Money transfers, improving payment speed (now within **10 days** of campaign completion in many countries), oversight, and reliability for millions of workers |
|  Data exchange | Integrates health outcomes with spending data for evidence-based allocation | Connects budget systems with service delivery tracking; enables faster and more streamlined reporting | Enables real-time performance monitoring; links expenditure to health outcomes | **Rwanda's** digital government platform (Irembo) offers 100+ digital services, based on shared data including a national digital ID. This has reduced average service delivery time (such as registration for health insurance), from **5 days to 24 hours** |

*Note: (1) Typically, DPI approaches, including those pictured here, combine multiple DPI components.*
*Sources in Annex*

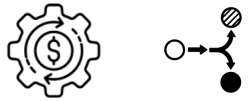
# DPI principles have the potential to transform rigid, single-purpose systems into adaptable platforms that evolve with government needs

| **Traditional design principles**<br>*Rigid, single-purpose systems* | **DPI principles**<br>*Adaptable platforms serving evolving needs* | **Impact on service delivery**[1] |
|---|---|---|
| Proprietary systems requiring custom connections for each system pair | **Interoperability**. Standard "languages" allowing different systems to connect and share data automatically | Estonia's X-Road connects 450+ organizations across sectors, enabling 99% of public services online and reducing cabinet meetings from 5 hours to 30 minutes |
| Monolithic systems trying to do everything within a single application | **Minimalist, reusable building blocks.** Core functions built once and used across many services, avoiding duplication | MOSIP's open approach enabled 25 countries to adapt the identity platform and mitigate risks of proprietary single-vendor systems, significantly reducing implementation costs. |
| Vendor lock-in limiting who can maintain or extend the system | **Enables innovation.** Multiple organizations can build upon shared infrastructure, not just the original vendor | India's ABDM health sandbox tested 867 applications from diverse developers, with 40 successfully integrated into the national health ecosystem—demonstrating multi-vendor innovation on shared infrastructure. |
| Centralized databases requiring data migration and consolidation | **Federated & decentralized data.** Data stays with its original owner but can be securely shared when needed | India's Account Aggregator framework enables individuals to consent to financial data sharing without centralization, facilitating loan approvals in minutes rather than days while maintaining data ownership |
| Security bolted on after development | **Security & privacy by design.** Protection measures built from the start, not added later | EU COVID certificate systems implemented privacy controls from inception (data minimization, strong consent, interoperable encryption), avoiding costly retrofitting and establishing user trust |

*Sources in Annex*

# In summary, barring systemic constraints, DPI could enable PFM to have a transformational impact on health service delivery

*ILLUSTRATIVE*



**Potential benefits from DPI approach**

## Information benefits

- Standardized data helps to **correlate spending & health outcomes**
- Registries provide **single source of truth**
- Data collection at source & standardization enable **timely, comprehensive** data
- Registries & digital data collection at source increase **trust in data**

## PFM outcomes

- **Allocation & planning is** driven by timely evidence on needs
- **Smooth resource flows** with faster approvals & disbursements
- **Greater accountability** by connecting verified fiscal & health outcome data

## Health service delivery

- **Essential medicines** consistently stocked via predictive supply chains
- Verified **workforce reliably present** with on-time payments
- **Equipment fully functional** via proactive maintenance funding
- **Operational costs** covered and controlled by facilities
- **Patients protected financially** through working insurance systems

**Structural, political enablers**

**Digital investments, e.g.,**

- Expansion of ICT infrastructure
- Digital literacy & capacity
- Data use

**PFM structural changes, e.g.,**

- Greater flexibility in purchasing
- Greater local autonomy in spending based on needs
- Streamlined fund request processes

**Health system strengthening, e.g.,**

- Workforce capacity
- Geographic disparities
- Health system structure, service design

Governance across levels, politics & incentives, fiscal space, donor dependence, state capacity

# Implementation considerations

# A lifecycle approach to software development strengthens the delivery of DPI approaches

## 1. SOUND PLANNING AND GROUNDWORK

**Analysis of current state**

**Governance and financing**

**Enabling environment**

Critical preparatory work to

- Understand and plan based on **country readiness** for DPI
- Setup + ensure **cross-ministry collaboration** (incl. MOH-MOF)
- Ensure clear use case grounded in pressing **govt priorities, political window** of opportunity
- Align with digital and health strategies; and other partner initiatives to **reduce fragmentation**
- Plan long-term, including **governance, financing, policies, scalability**, and M&E

## 2. EFFECTIVE SOFTWARE DEVELOPMENT

**Appropriate tech. selection**

**User-centered design**

**Technical project management**

Software development/upgrade that

- Considers **existing digital public goods (DPGs)** and what **exists in-country** before building
- Involves **end users** and frontline workers in design and implementation
- Is **agile, iterative**, and prioritizes user satisfaction—which may require changes to government procurement processes
- Builds for sustainability and **scalability** from the start

## 3. SUSTAINABLE TECHNOLOGY ROLLOUT, UPTAKE, AND INSTITUTIONALIZATION

**Technology rollout**

**Data culture and feedback loop**

**Institutionalization**

A roll-out process that

- Ensures **cross-sectoral deployment** (e.g., MOH, MOF, Ministry of ICT, as relevant)
- Prioritizes end users and minimizes disruption in the training, **change management**, and adoption of the tech
- Is well planned and **context-specific**
- Updates the **enabling environment** (infrastructure, policies and protocols, workflows)

Ensuring sustainability by

- Driving progressive gains in **data quality, access, and use**
- Iteratively **improving and updating approach** based on feedback and additional needs
- **Transitioning** support and maintenance to government and local partners *(if applicable)*
- Establishing **robust governance, policy,** and **legal/regulatory frameworks to** institutionalize DPIs, data privacy, cross-sectoral collaboration, interoperability

*Sources in Annex*

# Match implementation approach to country readiness across technical and institutional dimensions

**Country readiness determines the starting point, not the destination**
DPI approaches work universally, but implementation pathways differ based on the following interconnected dimensions. Countries at any readiness level can begin—the key is matching approach to current capabilities while building toward full interoperability.

| Factor | Less ready | More ready | Recommendations to move towards DPI Approach |
|---|---|---|---|
| **Leadership and Governance**<br><br>**Legislation and Policy** | • Siloed ministries<br>• No laws or policies on data security, privacy, consent, confidentiality and access<br>• Complex procurement | • Cross-ministry coordination (incl. MOH-MOF)<br>• Clear data regulations implemented and enforced<br>• Agile procurement | • Begin with domain-specific implementations<br>• Establish governance structures before technical implementation<br>• Apply federated data principles within individual ministries |
| **Infrastructure** | • Limited connectivity<br>• Limited plans for support and maintenance of infrastructure | • Robust connectivity | • Implement offline-capable data exchange protocols |
| **Services and Applications**<br><br>**Standards and Interoperability** | • Fragmented, limited-scale data systems<br>• No data registries<br>• No data exchange standards; no digital health architecture<br>• Limited data use for decisions | • National scale systems, map to digital architecture<br>• Geo-tagged data registries<br>• Data exchange standards established, routinely updated and used | • Prioritize master registries<br>• Focus on scaling a set of prioritized systems<br>• Start with minimal interoperability standards |
| **Workforce** | • Few technical staff<br>• Limited ecosystem of vendors<br>• Low end user digital literacy | • Available digital talent<br>• Mature digital ecosystem and partnerships | • Phase implementation with technical assistance<br>• Leverage existing Digital Public Goods (DPGs)<br>• Build capabilities alongside technology |

*Sources in Annex*

# DPI's modular approach is applicable across countries with different digital starting points

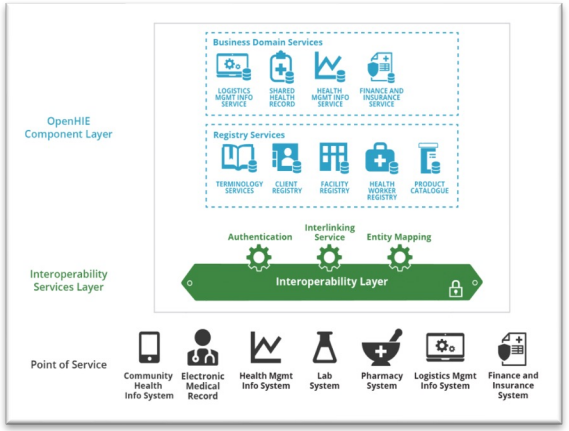
## Digital architectures often exist

In most countries, a **health information exchange** or digital government **architecture** are in place or envisioned.

These set out envisioned systems and registries; and specifications, standards, protocols for **interactions** between them.

This should **serve as a starting point** for any digitization or a DPI approach for PFM in health.

**OpenHIE architecture**




## DPI for PFM is possible and already in motion in LMICs

A sophisticated digital system or national scale DPI components are not prerequisites to apply a DPI approach.

Countries are ***already*** implementing at various stages:

- **Ethiopia**: Building foundational registries to enable data exchange
- **South Africa**: Leveraging existing digital ID program as a foundation for reforms, e.g., for national health insurance reform
- **Nigeria**: Leveraging IDs in interoperable insurance platform for claims mgmt.

## Data registries exist across departments

Most countries already have **valuable master lists & digital registries** scattered across ministries. These provide immediate starting points:

- **Facility registries**: Often in Ministries of Health or Planning
- **Payroll databases**: Often in Ministries of Finance
- **Beneficiary or member lists**: To enable social protection programs or insurance schemes

If well-maintained, these can serve as initial foundations that can improve interoperability and exchange across systems, and where relevant can be expanded to create foundational DPI components.

*Sources in Annex*

# DPI cannot solve for all PFM challenges, and structural constraints need to be considered when pursuing a DPI approach

DPI cannot address all PFM challenges; while there are multiple constraints within wider PFM and political environments that DPI will not solve for. It is critical to understand whether a challenge can feasibly be solved with DPI and to consider underlying constraints when building an approach.

## ✓ DPI has potential to address:

- **Information flow bottlenecks**
  caused by siloed and often manual systems
- **Payment delays**
  due to manual verification & analogue payments
- **Resource leakage**
  due to weak oversight, poor expenditure tracking, manual verification processes
- **Data fragmentation**
  across disparate, siloed systems
- **Duplicate records and ghost workers**
  due to no updated, single source of truth

## ✗ DPI cannot fix:

- **Insufficient health budgets**
  while payments can be expedited and budgets better executed, there may still be insufficient funds
- **Legal/regulatory barriers**
  some changes may be required to PFM rules; national legal frameworks are needed to enable DPI
- **Core capacity constraints**
  creating and sustaining change requires the right skillsets and personnel across levels
- **Political economy challenges**
  DPI approach requires political buy-in, coordination, enforcement; data cannot solve for political economy issues
- **Infrastructure gaps**
  electricity, internet connectivity, and existing tools in place are core constraints to be considered

*Sources in Annex*

# Maximize existing systems and components before building anew

## 1 Use

**Leverage existing DPIs or components already in place, even if not perfect or foundational DPIs yet**

- Burkina Faso aims to use georeferenced master facility list across financial and logistics systems to enhance supply chain mgmt.
- Nigeria aims to link digital and health insurance IDs, and integrate into the health insurance platform to enable streamlined patient registration and billing

## 2 Adapt

**Modify systems & components that aren't yet DPI-aligned but have potential to be**

- South Africa has:
  - interoperable government accounting, logistics, and HR systems, but lacks shared registries. Adapting systems to use shared registries would allow data exchange and use across systems for regular expenditure mgmt.
  - biometric-tax linkage streamlines banking—extending to health could automate fee waivers based on tax status

## 3 Build

**Create new only when existing systems cannot meet core requirements.** Focus on modular, interoperable components rather than monolithic systems

- Many countries have or are building CHW registries where ID systems do not yet exist, given the need for a single unified list of CHWs; in the future, national digital IDs can link to the CHW registry for biometric verification

*Sources in Annex*

# Countries should leverage proven Digital Public Goods (DPGs) where they exist

DPGs are open-source software, data, standards, and content adhering to privacy, safety, and other best practices, and help attain the Sustainable Development Goals.

DPGs are reusable and adaptable to new contexts, and more robust and resource-efficient than proprietary tools; advancing digital equity and enable inclusive and transparent service delivery.

There are several **DPGs for DPI**, for example:

**Digital ID & Registries**

MOSIP *Digital ID*

DIGIT *Registry*

GeoPrism Registry

**Payments**

mojaloop

Mifos

**Data exchange**

OpenFn

X-ROAD

OpenHIM

There are also DPGs that help **address PFM for health** use cases, for example:

**Claims management**

HCX

openIMIS

**CHW payments**

CommCare by dimagi

medic

**Data collection & analytics**

dhis2

For a full list of DPGs, see Digital Public Goods Alliance Registry and Digital Square's Global Goods.

*Sources in Annex*

# Modernise procurement processes to enable iterative development aligned with DPI principles, within government constraints

| Category | Traditional procurement process<br>*Rigid, long/cumbersome, single purpose process* | Procurement process with DPI approach<br>*Adaptable process serving evolving needs* |
|---|---|---|
| **Design** | Solution driven starting point, stemming from policy needs and technical requirements | Problem-driven starting point, stemming from user needs |
| **Scope** | Specific to needs of one Ministry, Agency, Dept, or Unit<br>*e.g. Enterprise Resource Planning (ERP) systems which are often built for a single ministry or function* | Focus on shared assets that can be used across Ministries, Agencies, Departments, Units, and functions |
| **Budget** | Upfront capital intensive; optimize for low cost over quality | Recurrent, modular budgeting based on milestones |
| **Authorizing Environment** | Projects typically led by a single agency, dept or ministry (e.g., MoF), with little input from other departments; this can cause siloed products | Cross-cutting team with representatives from across ministries; led by a key stakeholder with political capital to drive the project and mitigate pushback |
| **Vendor selection** | Bias towards international tech providers that provide commercial, off the shelf (COTS) products<br>*e.g. 61% of countries use COTS for FMIS; 61% of these products are either from SAP, Oracle, and FreeBalance* | Use, adapt or build, with a range of options including open source and DPGs; miti vendor lock-in |
| **Development** | Sequential approach, capturing all requirements up front | Iterative approach, building and delivering as ready and needed |
| **Implementation** | Long implementation schedule, on average 8 years; highly impacted by regime and priority changes | Modular implementation schedule, with each component implemented as needed |

These modifications can work within existing government frameworks—not requiring wholesale regulatory changes

*Sources in Annex*

# New digital approaches should be accompanied with robust change management, and focus on producing benefits for end users

Change management is a critical part of software rollout, which prepares, supports, and guides users through the transition from the current state to the use of the new technology. It ensures adoption of the technology, minimizes any productivity losses, and builds trust.

The BID Initiative provides an example of utilizing a recognized change management approach to facilitate uptake of immunization registries across multiple African countries.

| Kottler's eight-step change model | Example for immunization registry |
|---|---|
| **Steps 7-8: Consolidate gains & anchor new approaches in the culture** | **Emphasize the decision-making and data use culture**. *e.g., embed change in the organizational culture and processes; recognize and reward new ways of behavior, institutionalize training and supportive supervision in data use for decisions* |
| **Steps 5-6: Create short-term wins, remove obstacles** | **Provide follow-up, show early success stories** *e.g., demonstrate how systems can be used to easily build reports; provide follow-up support and encourage health workers to use the system and build confidence* |
| **Steps 3-4: Create & communicate the vision for change** | **Communicate vision for data quality and use, and how will contribute to addressing challenges** *e.g., introduction of electronic immunization registry, incl. training and communications on its use for data collection and decision-making* |
| **Steps 1-2: Create urgency & build a guiding team** | **Create urgency and climate for change** *e.g., selection of a "guiding team" of health facility in-charges and support from district officials and regional/ provincial teams* |

*Sources in Annex*

# Challenges and potential solutions in action: case studies

# Case studies demonstrate the evidence and potential for DPI approaches to address common PFM challenges

- This section describes **priority challenges** and **emerging technical solutions** from selected deep dive countries. Each case study unpacks:
  1. Key **PFM challenges,** the driving **information bottlenecks**, and resulting impacts on **service delivery**
  2. **DPI approaches** — implemented, in progress, or envisioned — that have potential to unblock PFM challenges to improve service delivery, and the realized or potential **outcomes** from each
- While the focus here is on technical solutions, concurrent **investments in people, data use, processes, governance, and infrastructure** were, or will be, critical to success, but are not described here. For further detail, see Implementation Considerations.

| |  Burkina Faso |  Ethiopia |  India |  South Africa |
|---|---|---|---|---|
| **Key Challenge** | • Delayed Free Care Scheme **reimbursements** can affect **service delivery** | • Donor and government funds go **unspent** while essential **services and drugs are often unavailable** at facility level | • **Payment delays** of 144 days for urban day workers in Odisha<br>• 43% of allocated program **funds unspent** | • **High arrears and poorly allocated funds** leading to **stockouts**, lack of equipment maintenance, and **inequities in staffing** |

*Note: Case studies focus on DPI approaches that are either implemented, in progress, or planned/envisioned by the government; and those that are reflective of common challenges across countries. Insights from other deep dive countries are included in the next section (focused on cross-cutting themes).*

# BURKINA FASO



Photo credit: Murat Kahraman / Pexels

# Facilities can experience delayed and unpredictable payments from Burkina Faso's Free Care Scheme, which can affect service delivery

**Context:** Burkina Faso's government has made significant commitments to domestically-funded essential health coverage. In 2016, the Gratuité (Free Care) policy was introduced as a government-funded, comprehensive user fee exemption scheme that funds a defined package of healthcare services offered for free at facilities for pregnant women, lactating mothers, and children under five years old. It covers approximately 5 million beneficiaries.

## Information bottlenecks

- For **Ministry of Health,** data to enable facility reimbursements (e.g., services, drugs) are often paper-based and/or fragmented with quality issues, delaying allocations to health facilities and central medical stores
- **Ministry of Finance** must use a time-consuming, expensive verification process for prior period's expenditures, which delays future disbursements

## PFM challenges

- **Delays and unpredictability** in reimbursements to facilities can constrain cash flow and complicate planning and day-to-day service delivery (e.g., uneven timing and distribution of payments across facilities).
- **Debt build-up** at central medical stores (USD 33M in FY21) which is then indebted to suppliers

## Health service delivery challenge

- **Service readiness:** Financing bottlenecks can contribute to disruption of essential medicines at facility level.
- **Out-of-pocket (OOP) spend:** Average out-of-pocket spend for maternal care was at 29.6%, despite eligibility for Gratuité.
- **Reallocation of funding:** Facilities reallocated funds from service delivery to operational costs.

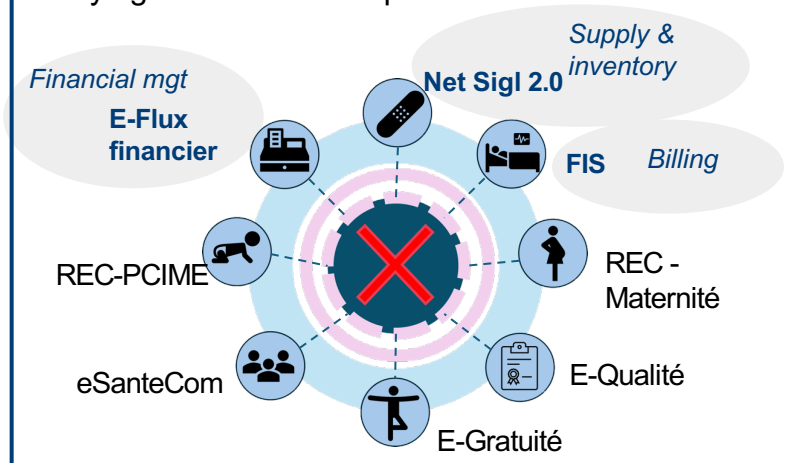
*Sources in Annex*

# Linking and analyzing data from existing facility-level systems would improve facility cash flow, and in turn enhance drug availability

## Existing systems

*Systems exist at facility level, but data is not standardized and often redundant across systems*

A **Minimum Digital Ecosystem (MDE)** with varying levels of scale up at PHC levels:




Systems at facility level **not yet interoperable**, & do not use same MFL; this makes data analytics & use challenging

**Master Facility List (MFL):** Single list of health facilities with geo-coordinates

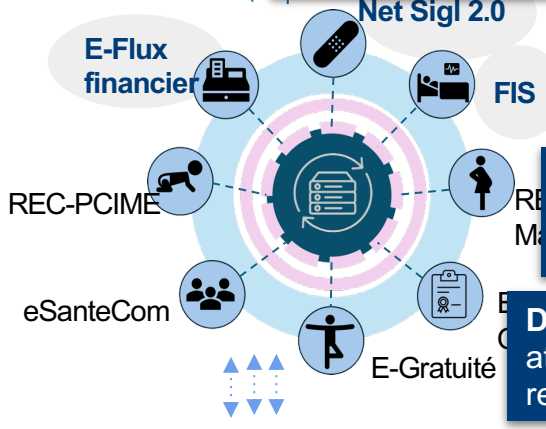
## Intervention

*Link minimum digital systems at facility level and analyze data to inform allocations and financial management*

Monitoring Dashboards

**Regularly analyze data** to ensure equity and efficiency in allocations

Timely data from MDE (disaggregated by facility) can be **analyzed regularly for allocation & mgt decisions**




**Data exchange**
Enables analysis of data from across systems

**Systems use MFL** as unique ID for facilities, enabling data exchange

**Digital payment platform** at facilities for collecting revenues

- Link all MDE systems to **Master Facility List**, to capture granular data by facility, including financial mgmt., billing, and stock mgmt. data
- Introduce **payment platform "Faso Azerka"** allowing beneficiaries to pay and govt to send resources to facilities

## Potential Impact

*Equitable cash flow across facilities and reduction in stock-outs*

Use of timely data on claims & facility financial health may lead to:

- **Improved forecasting** of resource needs
- **Equity in allocations** to health facilities & CAMEG

This would contribute to:

- Improved, **equitable cash flow** for PHC facilities
- **Efficiency** in resource utilization at PHC level

And ultimately, lead to:

- Enhanced **drug availability**
- Equitable **service availability**

# ETHIOPIA



Photo credit: Melinda Stanley / CHAI

# Fragmentation of funding and information in Ethiopia hinders visibility and contributes to high underspend

**Context:** Ethiopia has a three-tiered health system structure, with primary, secondary and tertiary levels of care. There is a strong focus on primary health care and the government has committed to achieving universal health coverage by 2030. External sources accounted for 34% of health expenditure in 2019/2020, including 20% off-budget funding. Essential primary health care services are therefore funded and provided by a variety of actors, including governmental, non-governmental, and private organizations.

### Information bottlenecks

- **Data silos**, with data scattered across multiple agencies and systems, that vary by source of funds and do not interact
- **Redundancy**, with fragmented systems leading to data duplication
- **Unstandardized and aggregated data,** often captured in different formats with insufficient disaggregation

### PFM challenges

- **Parallel financing mechanisms** introduced by many donors have caused fragmentation that complicate financial flows and visibility
- Insufficient reporting **delays disbursements**
- Poor data for allocation and reallocation decisions throughout the year leads to **high underspend**

### Health service delivery challenge

- **Funds not utilized or ineffectively utilized** for service delivery
- Despite funds being allocated, **essential services not available** at facilities due to lack of drugs and/or funds
- Has led to **rising out-of-pocket costs**

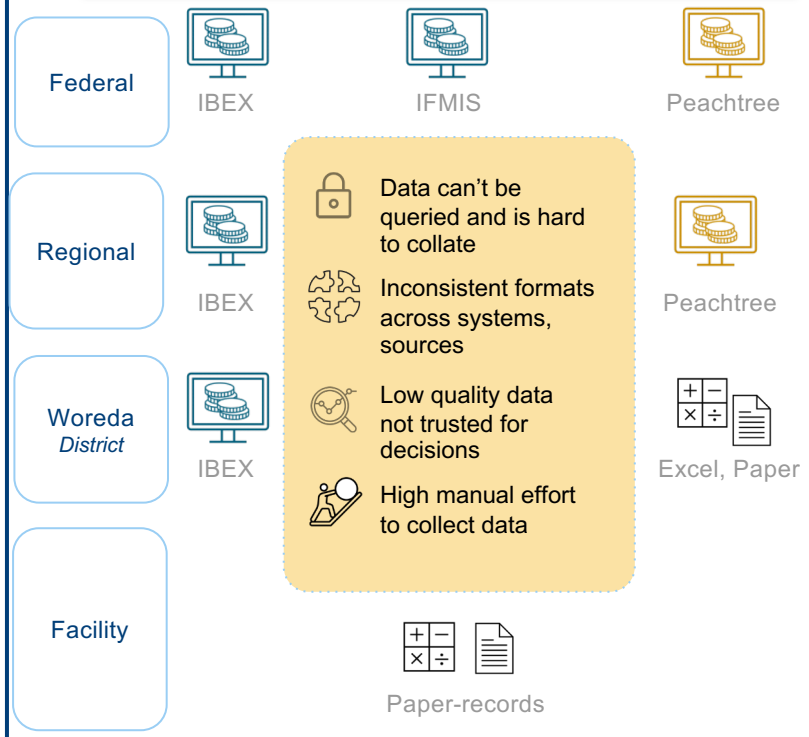
*Sources in Annex*

# Data standardization and exchange can connect data across systems and levels to improve reporting and expenditure management

## Existing systems

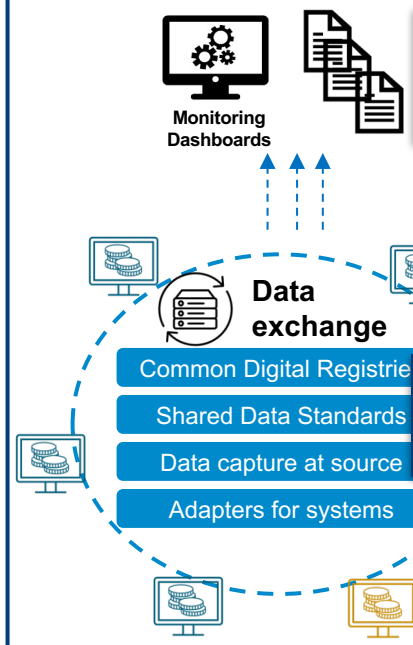
*Multiple fragmented tools and siloed systems hamper visibility of health finance flows leading to poor reporting and underutilization*

**Redundant data** scattered across **fragmented** digital tools and levels of the health system




## Intervention

*Modify existing systems to capture data in standardized manner, create interoperability and exchange using common data standards, registries, and adapters*




Timely data is available for **reporting & use** for PFM functions across levels

**Data exchange layer**

Link fiscal & service data across systems for timely, accurate decision-making

**Streamlined data capture** using existing systems, flowing into **data exchange**

**Minimal modification**

Modify existing systems to use digital registries, and collect standardized data close to source

**Common digital registries**

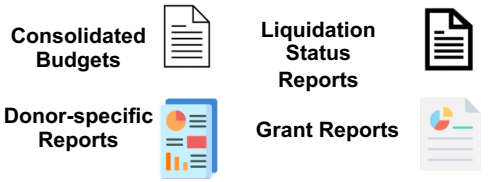
Standardize data attributes to create common reference data (programs, funding sources, etc.)

## Potential Impact

*Improve reporting and mgt through greater disaggregation and analysis of fiscal & service data, elimination of redundant data entry*

**Reduced Burden = Better Tracking**

More timely, accurate reporting and liquidation, with reduced reporting burden and making use of existing government systems




**Data Visibility = Better Finance Mgt**

Timely and granular visibility of financial flows (Program performance, allocation, execution & reporting delays) will lead to better tracking and efficient and equitable execution of funds

# INDIA

Photo credit: Sujata Khanna / WJCF

# MUKTA was designed to direct payments to the urban poor, but 43% of fund allocated remained unspent while workers went unpaid

**Context:** MUKTA is an urban development program in the state of Odisha, India where the government pays the urban poor for public works performed, e.g. sewage and sanitation and maintenance of public parks. The program is locally administered by Urban Local Bodies and Community-Based Organizations. The project had annual budget of USD 70M with an intended beneficiary pool of 700K wage seekers. The payment setup for the daily wage workers mirrors how payments are made for community health workers in many countries.

### Information bottlenecks

- Suboptimal processes and limited verifiability and timeliness of wage seekers' **attendance and performance**
- **Manual bill generation** and claims management processes
- Fragmented data with **manual data entry** and **inconsistent** records across agencies
- **Limited visibility** on fund utilization and expenditures

### PFM challenges

- **Severe payment delays,** with average time taken to disburse beneficiary payments estimated at 144 days
- **Excessive administrative burden**, with 10+ stages of approvals for wage payments that significantly delay fund disbursement
- 43% of funds allocated to the project **remained unutilized**

### Service delivery challenge

- **Critical urban services** like drainage and roads go **unfinished**
- Workers and community organisations **receive highly delayed payments**

*Sources in Annex*

# Data exchange between fiscal systems & work management systems led to a 92% decrease in payment disbursement time

## Existing systems

*Current fiscal systems, while comprehensive, had bottlenecks in program level workflows*

Fin Dept

**IFMIS**
Finance Dept System

- Finance outlook
- Debt Mgmt
- HR management
- Investments
- Treasury
- Payroll

**No Visibility + Delays**

**Paper-based processes** at urban department became bottleneck for **timely payments** to workers

**Manual Process**

Urban Dept

**Manual Works Mgt**

- Hard to verify proof of work
- Cumbersome process for bill finalization & approval
- Unable to track & manage delays in payments

## Intervention

*Leverage existing systems & interoperability with new systems to digitalize manual processes & enable exchange*

**IFMIS**
State Finance Dept System

Timely Payment → **Workers**

**Standardized Fiscal Data**

Fiscal data flow streamlined for **expedited payments** and **end-to-end visibility**

**iFIX**
Integrated Fiscal Info Exchange

Fiscal data standards, allowing any systems to exchange fiscal data and create end to end visibility on chain of transactions

**Monitoring Dashboards** — **Fin Dept** — **Urban Dept**

**Standardized Fiscal Data**

**Easy to track** operations, **verify** work, and **approve** smart payment digitally

**DIGIT**
Public Works Mgmt System

- Project Administration
- Measurement Book
- Contract mgmt
- Estimation & Planning
- Vendor, Staff & Attendance
- Billing & Payments

**Verifying & Disbursing** ↔ **Officers**

**Proof of Work** ↔ **Workers**

## Impact

*Real-time expenditure mgt for Fin Dept; Timely payouts to workers and govt entities*

- Reduced disbursement time
- Improved utilization of funds
- Faster payment for workers

Payment success rate **80%**

Average beneficiary disbursement time **144 days** → **12 days**

Reduced administrative burden for approvals **16 days** → **2 days**

# SOUTH AFRICA

Photo credit: Ampersand Studio / CHAI

# The South African health system suffers from poor and low granularity data that limits its ability to allocate resources efficiently

**Context:** There are large disparities between public and private sectors in South Africa, with the public sector serving about 84% of the population with <50% of health expenditure. Public healthcare is tiered, with clinics providing primary care through nurses, community health centers (CHC) offering expanded services with doctors, and hospitals handling progressively more serious cases through a referral system.

## Information bottlenecks

- Most provinces (with the exception of Western Cape) have **aggregated financial and non-financial data** that does not attribute datapoints to granular service units
- There are also challenges with **data quality,** with manual data entry often causing inconsistent labelling (e.g., >17 registers per CHC for recording a single patient interaction)

## PFM challenges

- **Inequities and inefficiencies** in budget utilization, with updated, granular data not used regularly for reallocation (e.g., USD950M in wasteful expenditure across 4 provinces; USD195M underspend)
- Health facilities do not have **autonomy** to determine how to spend budgets, compromising efficiency and accountability
- Issues lead to **high arrears** of 12-15% across provinces

## Health service delivery challenge

- Anecdotal evidence of **unavailability** of health-adjacent services, commodities, and consumables
- **Equipment in disrepair** because funds are reallocated away from maintenance, causing delays or referrals
- Staff **unevenly and inequitably distributed** across cadres and geographical areas

*Sources in Annex*

# A system with functional business units, that supersedes the existing systems, could direct funds and services where they are needed

## Existing systems

*Fragmented digital and paper-based systems without granular data capture hampers visibility over financing flows and service inputs for regular resource mgt*

**Digital tools exist** at provincial and national level:

**National**
- **BAS** Accounting
- **Persal:** HR management

**Provincial**
- **Siloed systems**, without cross-system integration; **manual data capture** at facilities
- **LOGIS:** Logistics
- **DHMIS:** Health mgmt

**District**

**Facility**
- Manual financial tracking systems at facility level, with data aggregated at provincial level
- Paper-records

Data exchange for govt depts exists at central level, but is only used by specific depts, such as Home Affairs, Police, Tax Revenue Authority

Fiscal data **not sufficiently granular**; data exchange not fully utilized

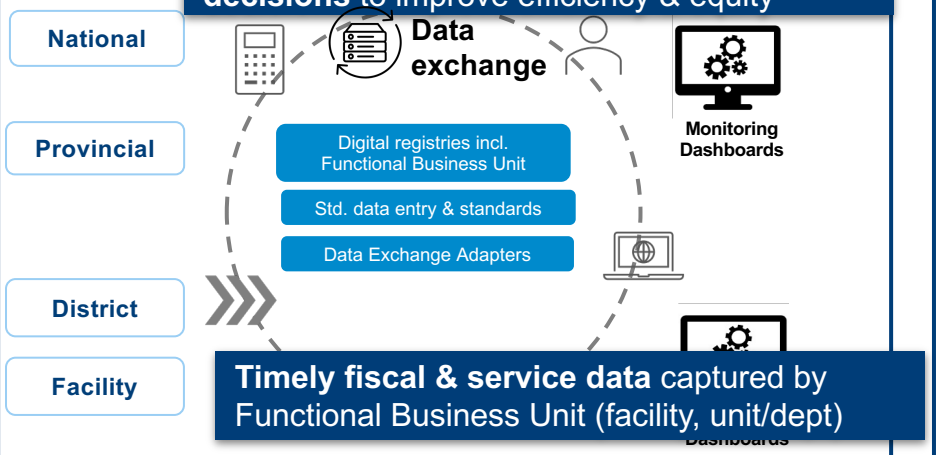
Current Chart of Accounts does not capture granular data by facility, unit/dept (Functional Business Unit)

## Intervention

*Ensure all systems capture data in granular, standardized manner by Functional Business Unit; use standards and adapters for interoperability and automated data sharing*

**Data exchange** allows regular **analysis of fiscal and service input data** across facilities and units/departments

Data is analyzed regularly through exchange across levels for granular **(re)allocation decisions** to improve efficiency & equity




**Timely fiscal & service data** captured by Functional Business Unit (facility, unit/dept)

Systems collect data at source using **common digital registries** incl. Functional Business Units, to accurately attribute spending (by facility, unit/dept)

## Potential impact

*Greater disaggregation and exchange of data, used across levels, can improve efficiency*

In some provinces (Western Cape), this approach has:

- **Improved efficiency**, ensuring funds and service inputs are available in the right places, in the right quantities
- **Enabled localized, data-driven budget (re)allocation** decisions on staffing, logistics, supply chain

# Challenges and potential solutions in action: cross-cutting themes

# Analysis of common PFM challenges across countries shows potential for DPI approaches to resolve critical bottlenecks

## 1. Common challenges

We identify several cross-cutting themes in challenges across multiple countries

**CHW payments**

Community Health Worker (CHW) payments can be unpredictable; CHWs face long delays, incomplete payments, & lack of visibility

**Claims management**

Manual verification of claims and multi-level approvals can delay facility reimbursements under insurance or free care schemes

**Supply chain**

Challenges with procuring and financing medicines & commodities, leading to frequent stockouts and/or expiries

## 2. Process flows

We map out processes & bottlenecks across several countries that exemplify common themes

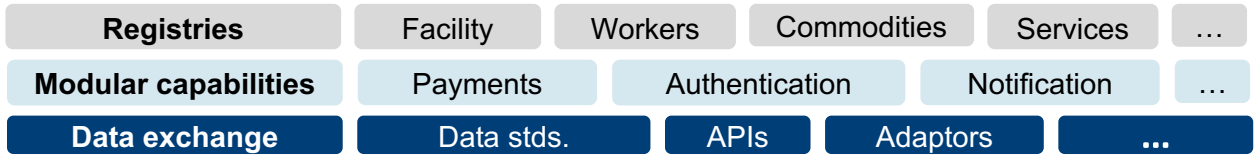

## 3. Information bottlenecks

We focus on where issues with data capture at source can cause bottlenecks hindering PFM operations

Challenges with data capture at source = Data for PFM operations not trusted or avaialble on time

## 4. Illustrative DPI approaches

We explore solutions where modular components (registries, capabilities, etc.) can resolve critical bottlenecks




# CHW PAYMENTS

Photo credit: Dominic Mukumbila / CHAI

# Community health worker (CHW) payments can be unpredictable, including long delays, incomplete payments, and lack of visibility (1/3)

Timely and accurate payment of community health and campaign workers remains a persistent bottleneck, which undermines motivation, continuity of services, and public trust. This slide details the problem in Burkina Faso, Cameroon, and Sierra Leone, as an illustration of the commonalities and challenges across countries.

| CHW payment process steps | CHW Registration<br>*CHW master list (linked to mobile number & ID); stored in digital registry* | Proof of work<br>*Record of what services were delivered* | Verification of proof of work<br>*Services verified, CHW payment eligibility confirmed* | Fund transfer approval<br>*Funding source (Treasury, donors, etc.) approve transfer and payments* | Payment<br>*Mobile payments sent to CHWs, through payment aggregator or telecom provider* | Reconciliation<br>*Reconciliation report records payments made/failed; troubleshooting* |
|---|---|---|---|---|---|---|
| **Burkina Faso**<br>*Avg. 6-month delay in CHW payments* | CHW Master List is digitized; but infrequently & incompletely updated | Preparation of paper based monthly report | 3-4 months delay with manual verification, supervisor visits required by MOF; HR capacity limitations | Funders take 3-4 months to approve payments, once govt shows proof of co-financing | Mobile money ID discrepancies require checks, cause delays | Limited staffing for failed payments follow-up |
| **Cameroon**<br>*67% of CHWs report payments less than due amount* | Inventory of CHW workforce exists, completeness not known; no digital CHW registry | No standard reporting, mostly paper based & varies by partner | Non-standardized verification processes cause delays & inconsistencies; HR capacity limitations | Delayed or not paid due to insufficient funds | Ghost workers (SIMs), instances of same CHW paid by multiple donors, others not paid | No mechanism of intimation to CHW on payment failure |
| **Sierra Leone**<br>*CHWs paid avg of only 53% of months worked (with range of 15% to 69%)* | Partial digitization, some CHW unregistered | Paper reporting despite digital systems in place; reports delayed, un-standardized, incomplete | Multi-level verification based on incomplete and delayed data; HR capacity limitations | Multi-level review & validation required; often delayed | Currently no budget line for CHW incentives which constrains fund availability | Difficult to reconcile performance and pay |

*Sources in Annex*

# Despite process differences, countries experience similar challenges and underlying information bottlenecks (2/3)

There are common challenges in CHW payments across countries; many of them stemming from information bottlenecks.

| CHW payment process steps | CHW Registration | Proof of work | Verification of proof of work | Fund transfer approval | Payment | Reconciliation |
|---|---|---|---|---|---|---|
| | *CHW master list (linked to mobile number & ID); stored in digital registry* | *Record of what services were delivered* | *Services verified, CHW payment eligibility confirmed* | *Funding source (Treasury, donors, etc.) approve transfer and payments* | *Mobile payments sent to CHWs, through payment aggregator or telecom provider* | *Reconciliation report records payments made/failed; troubleshooting* |
| **Common challenges** | Master lists incomplete, out-of-date, fragmented; often not digitized; no unified list to use across systems | Data entry manual, incomplete, un-timely, non-standardized | Paper records create high processing times; HR capacity limitations; low trust leads to multiple rounds of verification | Multi-level approvals for fund transfers (e.g., donors, MOH, MOF) | Payments require linking ID & mobile #; poor comms with CHWs; challenges with network coverage & mobile vendor partnership | Lack of reconciliation report; limited staff to reconcile payment failures & communicate with CHWs |

Major information bottlenecks that hinder effective CHW financing:

**Data gaps**

**Challenges with data capture at source, e.g.:**
- Standard, granular data on services delivered
- Each service linked to CHW Unique ID, status; geography, beneficiaries, etc.
- Proof of payment to each CHW

=

**Data to process payments not available on time**
- Verified aggregates of services delivered not available
- Connection between services delivered and CHW

*Sources in Annex*

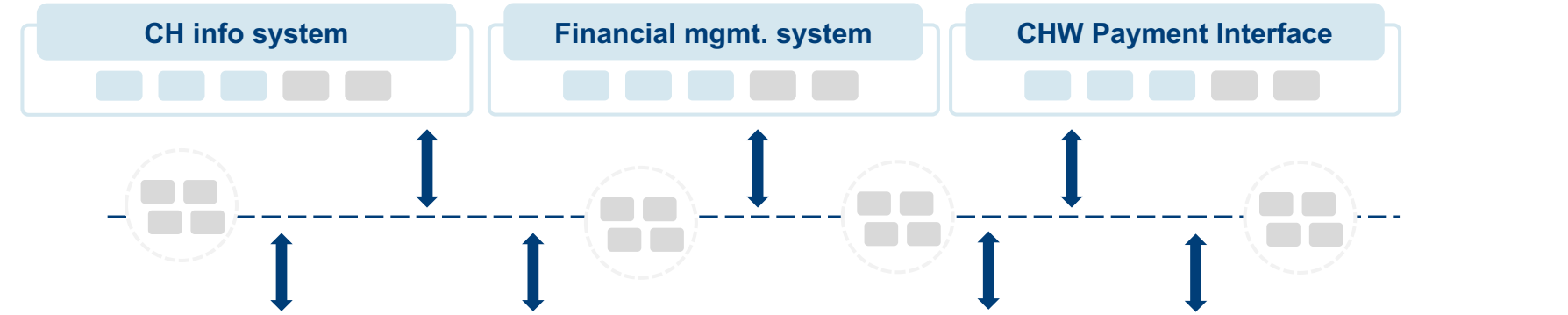
# Rather than solving each bottleneck as a standalone use case, DPI approach solves information gaps across multiple interactions (3/3)

This slide illustrates one potential operationalization of this DPI approach, where modular DPI components can be used to develop digital applications capturing data at source, and data exchange mechanisms can enable exchange between points of service delivery, financial flows, and decision making. Decisions and actions can then be based on complete, timely, and linked information

**Illustrative Applications**
*Systems use reusable DPI components to log services delivered and payments*

**Data Exchange**
*Enabling information flow for different process steps*

**Illustrative Process Steps**
*To note that these can be streamlined/reimagined with DPI approach*




***Faster, lower-cost verification** of identities & services delivered*

***Quicker disbursement of funds** for services delivered*

***Streamlined payments & communications** to CHWs*

**Illustrative DPI components for CHW payments**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Registries** | Facility | CHWs | Commodities | Services | Beneficiary | … | |
| **Modular capabilities** | Payments | Authentication | Notification | Workflow | … | | |
| **Data exchange** | APIs | Adaptors | Std. exchange protocols | ... | | | |

**Governance sits outside any one entity**

*Note: Some countries envision an approach like this. For example, the MoH in Burkina Faso has the ambition to connect their CHW registry to the digital Community Health Information System and payment system.*

# CLAIMS MANAGEMENT

Photo credit: Melinda Stanley / CHAI

# Verification of claims and multi-level approvals can delay facility reimbursements under insurance or free care schemes (1/3)

Many countries offer subsidized health insurance or free care schemes; however, health facilities can struggle to determine eligibility of patients, payments are delayed, and patients are forced to pay out of pocket for services meant to be free. This impacts accessibility and quality of care, as patients are turned away, charged informal fees, or forego services due to cost.

| Claims management process steps | Scheme enrollment<br>*Beneficiary enrollment (if applicable)* | Patient & service registration<br>*Patient registers at facility, gets service* | Claim verification<br>*Aggregated claims sent to purchaser, verified* | Fund allocation<br>*Funds allocated to facilities based on claims & other criteria* | Fund transfer approval<br>*Funds are approved & transferred to purchaser* | Payment<br>*Funds paid to facilities or other supplier* |
|---|---|---|---|---|---|---|
| **Burkina Faso**<br>*USD 55m owed to facilities in FY22, 3-4 months to verify claims* | *N/A (not identified as bottleneck; facility confirms eligibility using demographic data)* | *N/A (not identified as bottleneck; facility confirms eligibility using demographic data)* | Local NGOs verify aggregated claims manually, at high costs (~5% of annual Gratuité budget) | Aim to allocate funds based on equity criteria in addition to verified claims; delays process | MOF & MOH's Dept of Admin & Finance do secondary verification before approvals | *N/A (not identified as bottleneck; transfers made to districts and medical stores)* |
| **Cambodia**<br>*Reimbursement delays, out-of-pocket spending high at ~60% of health exp.* | Complex criteria & procedures for identifying & qualifying beneficiaries; fragmented health protection schemes | Scheme exclusions/ restrictions result in patients being charged out of pocket despite being eligible for free care | Payment agency verifies aggregates against individual paper-based claims, causing delays | *N/A (not bottleneck; payment agency allocates based on verified claims)* | Several layers of secondary verification between government agencies before approvals | Payment process differs from routine processes and facilities face uncertainty in when to expect payment |
| **Nigeria**<br>*Persistently high out-of-pocket spending at 75%+ of health exp.* | Cumbersome scheme enrolment processes hinder uptake | Unavailability of data by patient on scheme enrolment, entitlements | Low verifiability of claims submitted; treatment given not linked to enrolee | Allocations based on proxies due to lack of verifiable need/claims | Average of 45 days to process approvals | Facilities face uncertainty in when to expect payment |

*Sources in Annex*

# Despite process differences, countries experience similar challenges and underlying information bottlenecks (2/3)

There are common challenges in claims mgt. across countries; many of them stemming from information bottlenecks.

| Claims mgt process steps | Scheme enrollment | Patient & service registration | Claim verification | Fund allocation | Fund transfer approval | Payment |
|---|---|---|---|---|---|---|
| | *Beneficiary enrollment (if applicable)* | *Patient registers at facility, gets service* | *Aggregated claims sent to purchaser, verified* | *Funds allocated to facility based on verified claims* | *Funds are approved and transferred to purchaser* | *Funds paid to facilities or other supplier* |
| **Common challenges** | Inefficient enrollment processes incl. checking eligibility; multiple, fragmented forms of identification; fragmented insurance and subsidy schemes | Patient ID lookup is manual; lack of defined benefit package; incomplete, non-standardized claims data collection | Paper records increase processing time; multiple rounds of verification required | Low trust in data leads to multi-level approvals with limited visibility of required funds | Time-consuming MOF approval process, little communication to facilities on when to expect payment | Analogue payment processes are common, further delaying payments |

Major information bottlenecks that hinder effective claims processing:

**Data gaps**

**Challenges with data capture at source, e.g.:**

- Individual digital record of service delivery at source to capture service delivered, cost, beneficiary as needed for claim verification
- Drugs/commodities used (if applicable)

=

**Data to process payments not available on time**

- Aggregates for service delivery claims at facility level
- Information can be drilled down and verified
- Used for faster/ automated approvals and triggering payments

*Sources in Annex*

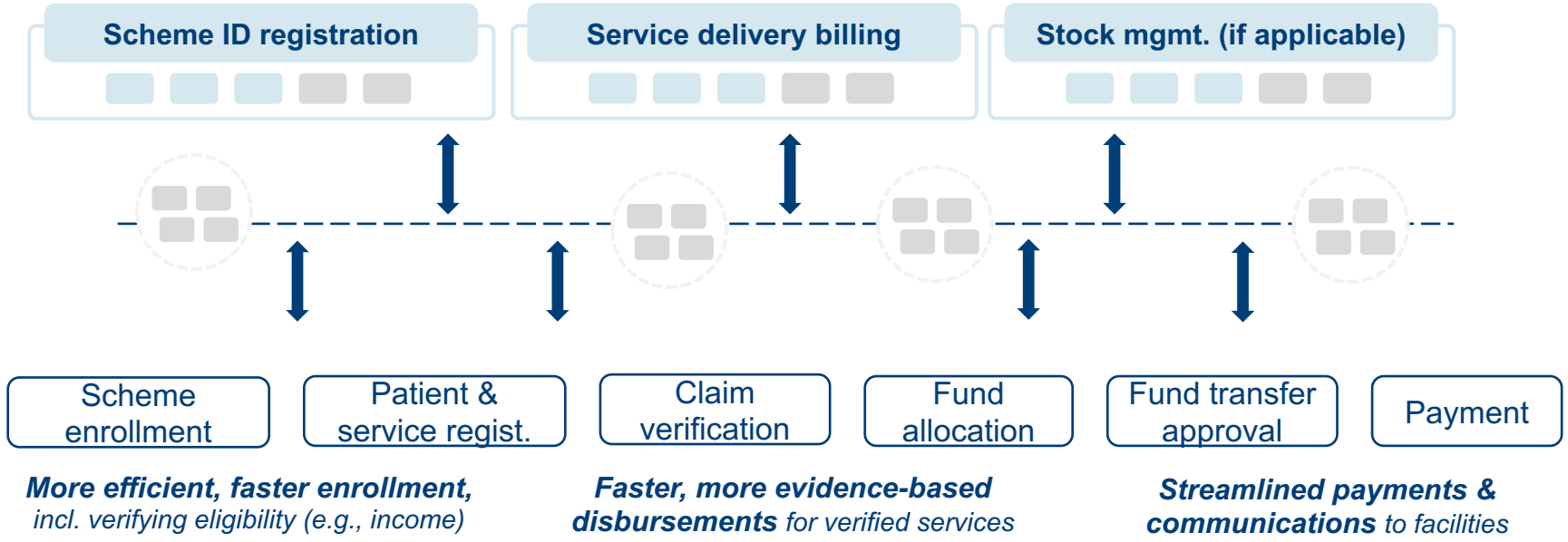
# Rather than solving each bottleneck as a standalone use case, DPI approach solves information gaps across multiple interactions (3/3)

This slide illustrates one potential operationalization of this DPI approach, where modular DPI components can be used to develop digital applications capturing data at source, and data exchange mechanisms can enable exchange between points of service delivery, financial flows, and decision making. Decisions and actions can then be based on complete, timely, and linked information

**Illustrative Applications**
*Systems use reusable DPI components to log services delivered and payments*

**Data Exchange**
*Enabling information flow for different process steps*

**Illustrative Process Steps**
*To note that these can be streamlined/reimagined with DPI approach*




**Illustrative DPI components for managing claims**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Registries** | Facility | Product | Health service | Diagnosis | Beneficiary | … | |
| **Modular capabilities** | Notification | Authentication | Bill gen | Workflow | … | | |
| **Data exchange** | Claims API | Adaptors | Std. exchange protocols | ... | | | |

**Governance sits outside any one entity**

*Note: Some countries envision an approach like this. For example, in Lagos state in Nigeria, there are efforts underway to link the state digital ID to the electronic medical records (EMR) system and insurance enrollment and management system, to expedite service verification and payments to facilities linked to an individual's ID and scheme enrollment.*


# SUPPLY CHAIN

Photo credit: Eric Gitonga / CHAI

# Countries face challenges procuring and financing the right supplies, ensuring they are available on-time and in the right facilities (1/3)

Fragmented (often paper-based) data and supply chains, as well as financing misallocations and delays, can impact supply availability & distribution. This leads to out-of-pocket payments at private pharmacies *(as such, ~80% of spending on health products in lower-middle income countries is OOP),* and patients foregoing care due to cost.

| Supply chain process steps | Prioritization | | Procurement | | Distribution | | Utilization |
|---|---|---|---|---|---|---|---|
| | *Forecasting needs for products* | *Budgeting & allocation* | *Procurement process (central/decentralized)* | *Payment to suppliers* | *Distribution to subnatl warehouses* | *Facility distribution (push or pull system)* | *Distribution & access to medicines* |
| **Cameroon**<br>*US4m deficit led to delay in procuring 20m vaccine doses* | Forecasting based on popn. stats, not consumption | Fragmented budgets across govt & donors | Long procurement timelines (avg 4.5 months, up to 10 months); weak supplier relationships | Co-financing challenges and payment mis-alignment causes delayed deliveries | Only 60% of facilities supplied by EPSS branches, others by District Health Offices | Misalignment of national pull vs. subnatl push system; facility arrears due to disbursement delays | Inaccuracies & incomplete consumption reports, often manual; 7+ data systems used, fragmenting data |
| **Eswatini**<br>*US3.25M expired medication at Central Med Stores for F/Y 24-25* | Over-quant., using popn. stats instead of consumption (unavailable) | Fragmented budgets contributes to underspend (70% FY 24/25) | Tedious process centralized at MoF, w/ minimal MoH autonomy; limited local suppliers | Inflexible PFM – only invoice when items delivered in full; emergency procurement inflates prices | Manual and paper-based ordering process of stock from central stores | Lack of robust system to monitor & track stock dispatched – leading to expiries | Loss of stock and non-visibility of its utilization leading to high OOP spending |
| **Ethiopia**<br>*Essential medicine availability ~28% in 2020 (with high regional variation)* | Inaccuracies in forecasting due to poor consumption reporting, often driven by historical data | Fragmented budgets (donors, government, facilities) | Fragmented procurement across govt & donors | Supplier payments can be delayed, risking govt contract credibility and delaying procurement | Delays due to complex subnatl distribution pathways | Challenges w last-mile delivery, high rates of expiries; facilities lack funds to pay medical stores, high arrears | High OOP<br>No tracking of utilization patterns at facility level |

*Sources in Annex*

# Despite process differences, countries experience similar challenges and underlying information bottlenecks (2/3)

There are common challenges across countries; many of these stemming from fragmentation and information bottlenecks.

| Process steps | Prioritization | | Procurement | | Distribution | | Utilization |
|---|---|---|---|---|---|---|---|
| | *Forecasting needs for products* | *Budgeting & allocation* | *Procurement process (central/decentralized)* | *Payment to suppliers* | *Distribution to subnatl warehouses* | *Facility distribution (push or pull system)* | *Distribution & access to medicines* |
| **Common challenges** | Untimely, inaccurate data to forecast needs<br><br>Quantification divorced from budget<br><br>Program-specific, fragmented quantification | Top-down budget formulation, not linked to forecasting<br><br>Fragmented budgets (sources, programs)<br><br>Budget adjustments, shortfalls<br><br>No systematic prioritization when funding falls short* | Fragmented procurement (health system levels, programs, donors), price variation across<br><br>PFM rigidities limit responsive procurement<br><br>Long procurement timelines, limited visibility on status* | Delayed disbursements & PFM rules (e.g., payment on delivery) can increase arrears to suppliers<br><br>Limited data to prioritize payments to suppliers | Fragmented & uncoordinated systems for storage, distribution, administration (across programs, donors, etc.)* | Over/under supply given lack of data (manual systems at facilities)<br><br>Facilities lack funds to purchase (delays in funding, claims)<br><br>Results in stock-outs and expiries | Patients pay OOP or referred to private pharmacies where drugs unavailable<br><br>No tracking of utilization, which hinders planning / distribution & can lead to fraud |

Major information bottlenecks that hinder effective supply chain management:

**Data gaps**

**Challenges with data capture at source, e.g.:**
- Consumption data by commodity, facility, program
- Payments made to suppliers and by facilities
- Status of tender and procurement by commodity

=

**Data across all steps not available on time**
- Forecasted needs and budgets based on consumption
- Tracking supplier payment delays, facility arrears
- Real-time data on stock levels for adequate supply



*Note: challenges in grey do not directly relate to or impact financing/PFM*
*Sources in Annex*

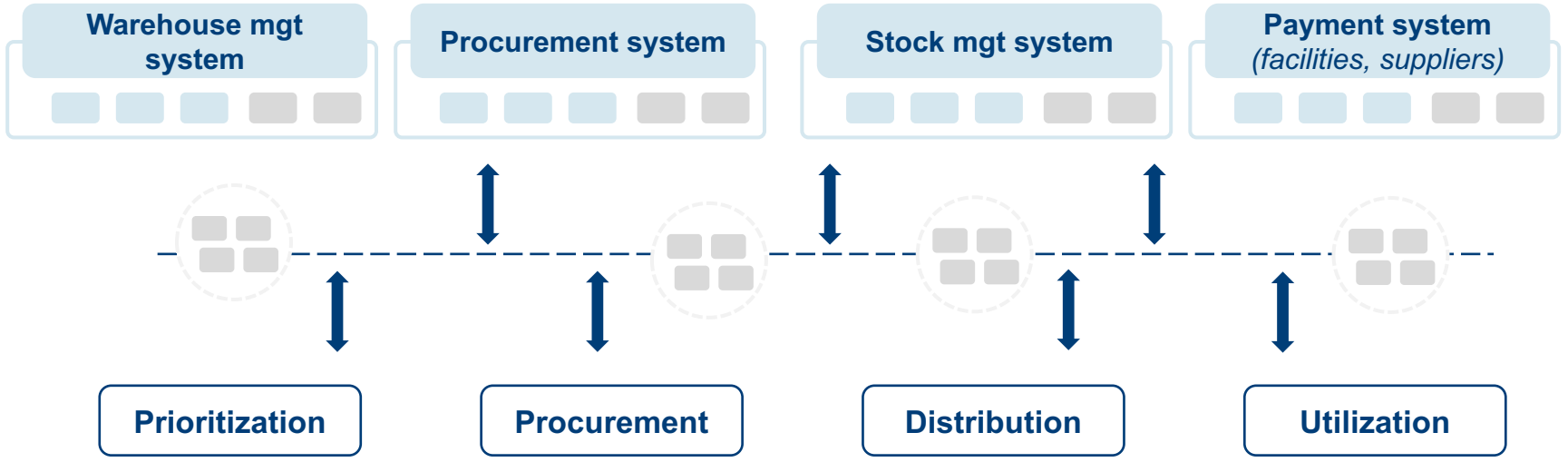
# Rather than solving each bottleneck as a standalone use case, DPI approach solves information gaps across multiple interactions (3/3)

This slide illustrates one potential operationalization of this DPI approach, where modular DPI components can be used to develop digital applications capturing data at source, and data exchange mechanisms can enable exchange between points of service delivery, financial flows, and decision making. Decisions and actions can then be based on complete, timely, and linked information

**Illustrative Applications**
*Systems use reusable DPI components to manage supply chain, procurement, stocks*

**Data Exchange**
*Enabling information flow for different process steps*

**Illustrative Process Steps**
*To note that these can be streamlined/reimagined with DPI approach*




***More evidence-based forecasting & budgeting,*** *based on actual needs*

***Responsive procurement & distribution*** *based on real-time availability and needs*

***Traceable transactions*** *for distributing/purchasing drugs*

**Illustrative DPI components for supply chain**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Registries** | Facility | Product | Program | Funding source | Geography | … | |
| **Modular capabilities** | Notification | Authentication | Payment | Workflow | … | | |
| **Data exchange** | APIs | Adaptors | Std. exchange protocols | **…** | | | |

**Governance sits outside any one entity**

# Disclaimer

This report is based on research funded by (or in part by) the Gates Foundation (INV-077573). The findings and conclusions contained within are those of the authors and do not necessarily reflect positions or policies of the Gates Foundation.

# Annexes

# Interviewees

# Key Informant Interviews and Partner Reviews (1/2)

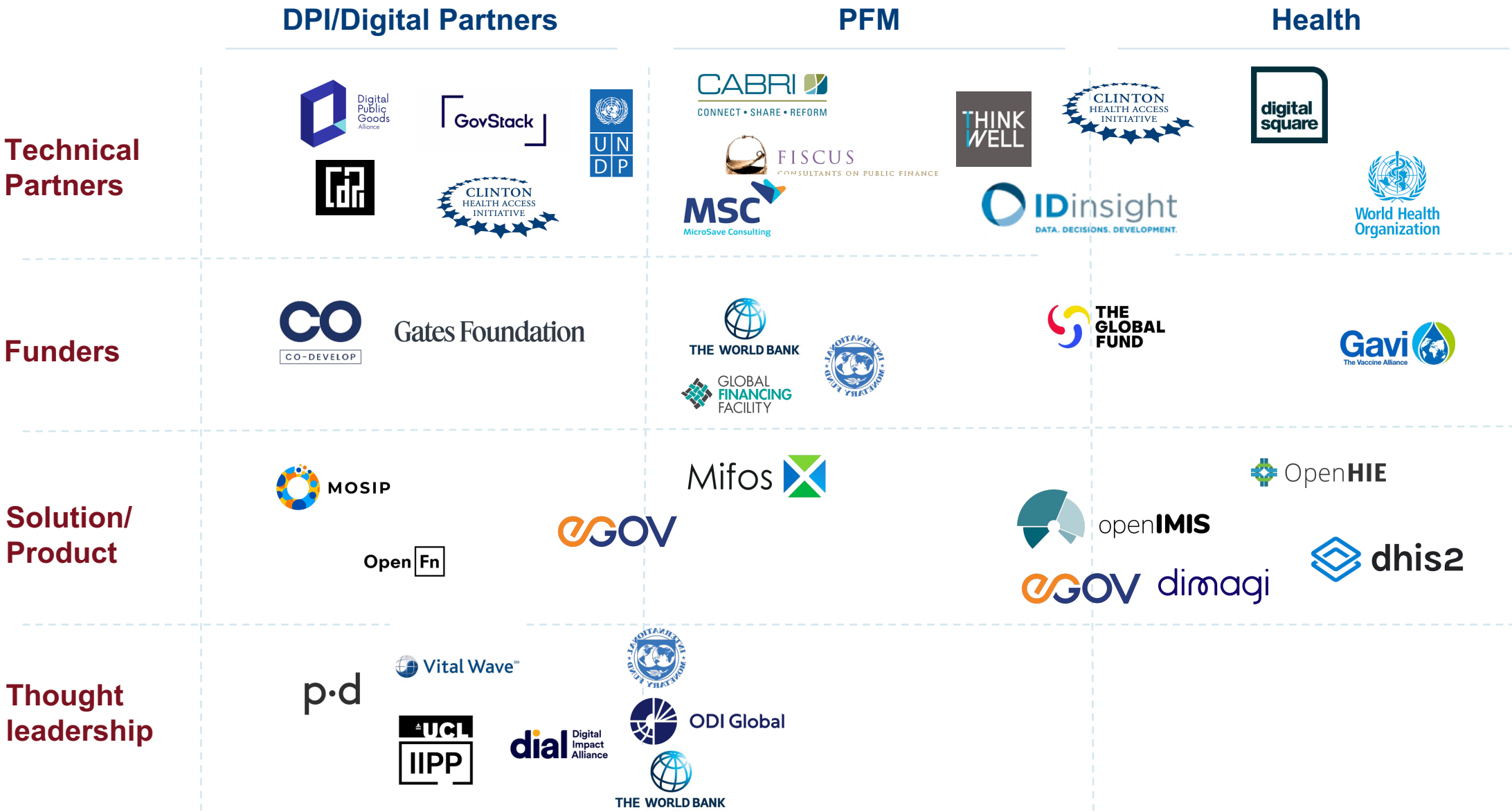
| No | Name | Designation | Organization |
|---|---|---|---|
| 1 | Kamya Chandra<br>Anusree Jayakrishnan<br>Daniel Abadie | Chief Strategy Officer<br>Tech Architect<br>Senior Advisor | Centre for DPI |
| 2 | Lauren Kahn | Head of Global Impact | Public Digital |
| 3 | Tom Hart<br>Cathal Long<br>Ameya Naik<br>Danielle Serebro<br>Antoine Lacroix | Senior Research Fellow<br>Senior Research Fellow<br>Research Fellow<br>Research Associate, ODI/Program Manager, CABRI<br>Collaborator | ODI Global |
| 4 | Helene Barroy<br>Kalipso Chalkidou<br>Ke Xu<br>Alain Labriqu<br>Garrett Mehl<br>Sophie Faye | Senior Public Finance Expert<br>Director Health Finance and Economics<br>Health Economist<br>Director, Dept of Digital Health & Innovation<br>Head of the Digital Health Systems Unit<br>Technical Officer, Health Financing | World Health Organization |
| 5 | Cristina Lussiana<br>Sean Blaschke | Health Specialist, Digital Health and Information Systems<br>Chief Digital Health and Information Systems | UNICEF |

# Key Informant Interviews and Partner Reviews (2/2)

| No | Name | Designation | Organization | |
|---|---|---|---|---|
| 6 | Saurav Bhattarai | Advisor | openIMIS | OpenIMIS |
| 7 | Jack Hilton | Product Strategy Director | Open Fn | OpenFn |
| 8 | Ismaïla Diène | Managing Director, Solutions | dimagi | Dimagi |
| 9 | Amy Paul | Senior Director of Professional Services | Vital Wave | VitalWave |
| 10 | Tim Wood | Chief Partnerships Officer | | Co-Develop |
| 11 | Manjiri Bhawalkar | Senior Economist | | World Bank / Global Financing Facility |
| 12 | Anmol Kamra<br>Devesh Sharma<br>Michael Chaitkin<br>Satish Choudhury<br>Alok Rajan | Program Officer, Development Policy and Finance<br>Program Officer, Development Policy and Finance<br>Senior Program Officer, Primary Health Care<br>Senior Program Officer, Malaria<br>Senior Program Officer, State Capacity and Public Finance | | Gates Foundation |

# Stakeholders Supporting DPI4PFM in Health

# There are several major stakeholders supporting this work across digital/DPI, PFM and health



# Glossary of Key Terms

# Glossary of key terms (1/4)

## Core concepts – PFM and Health Systems

- **Public financial management (PFM):** Mechanisms for collecting, allocating, spending, tracking, and accounting for public resources
- **Health system building blocks:** Six core components required for functioning health systems: service delivery, health workforce, information systems, medical products, financing, leadership & governance

## PFM Cycle

- **Budget Formulation:** Define priorities; allocate resources; develop spending plans based on policy objectives
- **Budget Execution:** Implement approved budgets; process financial flows, pay providers for goods and services, manage cashflow; track expenditures
- **Budget Monitoring:** Audit & evaluate performance; verify compliance; inform next planning cycle

## PFM Bottlenecks

- **Information bottlenecks:** Limited visibility across funding sources, delayed financial insights, disconnected outcomes, and incomplete fiscal picture for facilities
- **Resource bottlenecks:** Delayed payments, unpredictable disbursements, resources trapped in approval cycles, and funding that cannot be deployed in emergencies

# Glossary of key terms (2/4)

## PFM Systems

- **Financial Management Information Systems (FMIS):** Set of digital solutions to automate PFM processes including budget formulation, execution, accounting and reporting, as well as stewardship and reporting of revenues. When integrated with other government IT systems that provide extended PFM functions (eg. Payroll, e-procurement) it is referred to as Integrated FMIS (or IFMIS). Common systems include:
  - Financial management information systems (FMIS, most common), for fiscal monitoring and control
  - Debt management systems
  - Payroll
  - Procurement
  - Human resource management information systems
  - Treasury Single Account
  - Public investment mgmt. system (more nascent)

Source: World Bank Group. (2025). *Financial Management Information Systems (FMIS).* https://www.worldbank.org/en/topic/governance/brief/financial-management-information-systems-fmis

# Glossary of key terms (3/4)

## DPI Approach

- **Digital public infrastructure (DPI):** Systems (including digital software, platforms, APIs, and services, along with their related legal and regulatory frameworks, standards, policies, and processes) that serve as foundational, digital building blocks for public benefit; and the design principles that ensure DPI serves everyone, enables innovation, and evolves with changing needs
- **Digital public goods (DPGs):** Open-source software, data, standards, and content adhering to privacy, safety, and other best practices, and help attain the Sustainable Development Goals. DPGs are reusable and adaptable to new contexts, and more robust and resource-efficient than proprietary tools; advancing digital equity and enable inclusive and transparent service delivery.
- **DPI components:**
  - **Digital ID & registries:** Unique, unified, verifiable identification systems/databases for people, facilities, and resources. Digital ID can authenticate a person's identity and/or verify basic identity information (e.g., name, age) for transactions; while registries are a database providing a "single source of truth" to store information about specific entities (e.g., people, facilities) using unique identifiers.
  - **Payment systems:** Infrastructure to transfer money between people, government, and businesses digitally—including through bank and mobile money accounts.
  - **Data exchange:** Standardized protocols for systems to share information securely. Facilitate trusted sharing, exchange, or transfer of data, including personal and non-personal data, between individuals, governments, and/or firms.

Sources: Digital Public Goods Alliance. *Digital Public Goods Standard*. https://www.digitalpublicgoods.net/standard; Center for DPI, *DPI Wiki*. https://docs.cdpi.dev/the-dpi-wiki/dpi-overview
Clark, J., Marin, G., Ardic Alper, O.P., Galicia Rabadan, G.A. (2025). *Digital Public Infrastructure and Development: A World Bank Group Approach*. Digital Transformation White Paper, Volume 1. https://openknowledge.worldbank.org/server/api/core/bitstreams/bb08d389-cfbf-4417-9415-b9f65ef5c1f4/content

# Glossary of key terms (4/4)

## DPI Approach

- **DPI principles:**
  - **Interoperability via open specifications:** Standard "languages" (technological specifications, protocols and standards) allowing different systems and actors to connect and share data. This drives innovation and competition; while preventing silos and fragmentation.
  - **Minimalist, reusable building blocks:** Core functions built once and used across many services. This requires **unbundling** problems and solutions into core, modular, minimalist, and reusable building blocks, which can be connected through open protocols and specifications.
  - **Diverse, inclusive innovation ecosystem:** Multiple organizations, both public and private, can build upon shared infrastructure. A DPI approach enables diverse innovation by a public/private ecosystem of users, by allowing new systems and services to build on DPI at scale (akin to highways or the Internet) via tools such as open APIs, instead of monolithic systems.
  - **Federated & decentralized data:** Data stays with original owner but can be securely shared. Avoiding centralization, and instead focus on building databases/systems that are each reusable and accessible for different actors, securely.
  - **Security & privacy by design:** Protection measures built from the start. This can be through high auditability and traceability, and utilizing verifiable credentials and multiple factors of authentication.

Sources: Center for DPI, *DPI Wiki*. https://docs.cdpi.dev/the-dpi-wiki/dpi-overview; Clark, J., Marin, G., Ardic Alper, O.P., Galicia Rabadan, G.A. (2025). *Digital Public Infrastructure and Development: A World Bank Group Approach*. Digital Transformation White Paper, Volume 1. https://openknowledge.worldbank.org/server/api/core/bitstreams/bb08d389-cfbf-4417-9415-b9f65ef5c1f4/content

# Alternative DPI Framing, Additional Evidence

# A DPI approach established reusable building blocks used across functions, unlike traditional siloed approaches to digitization

## Traditional approach

Function-specific systems with limited integration across sectors

### Health

- Patient ID
- Health Worker ID
- ...
- Health Worker payment
- Facility payment
- ...
- Health Mgmt. HMIS database
- Logistic database
- ...

### Finance

- Tax ID
- Insurance #
- ...
- Payroll systems
- Mobile money infrastructure
- ...
- Integrated Fin. Mgmt. database
- Accounting data
- ...

### Agriculture

- Farmer Reg. #
- Extension Worker ID
- ...
- Subsidy payment
- Extension Worker payment
- ...
- Land records database
- Research data
- ...

## DPI approach

Standard, reusable building blocks used across functions and sectors

### Health

- Patient list
- Health Worker list
- HW payment
- Facility payment
- HMIS
- LMIS

### Finance

- Insurance list
- Payroll
- Mobile money payment
- IFMIS
- Accounting

### Agriculture

- Farmer list
- Extension Worker list…
- Subsidies
- Ag. EW payment
- Land records
- Research data

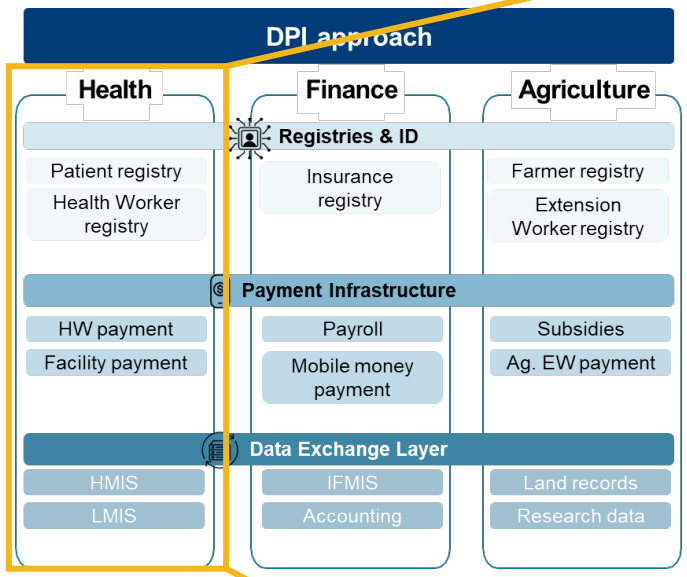
**Registries & ID**

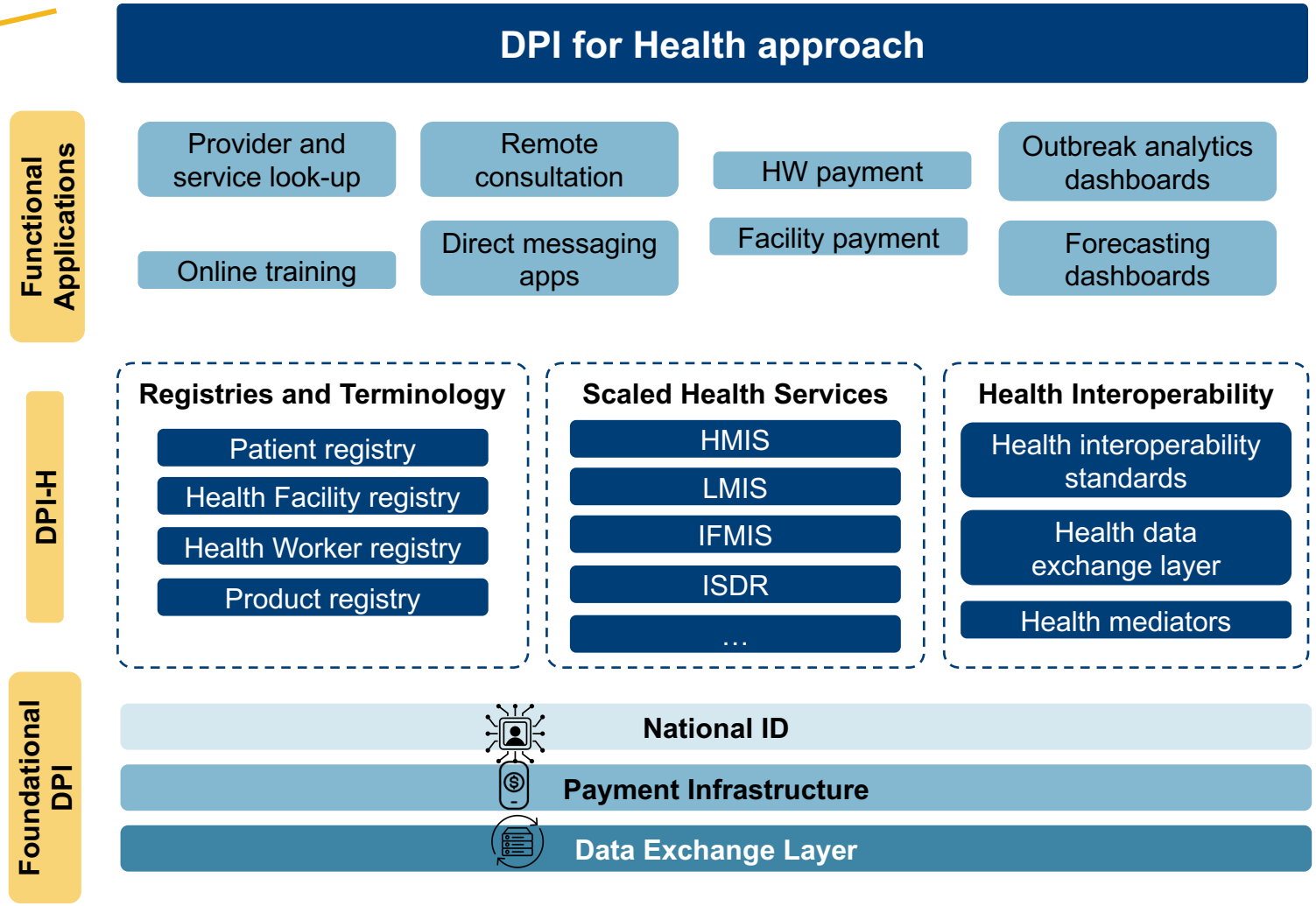
**Payment Infrastructure**

**Data Exchange Layer**

# Within functional areas (such as health), a DPI approach leverages cross-functional foundations to strengthen service delivery

Function-specific DPIs (e.g. DPIs for Health) and functional applications to deliver services can be created quickly and efficiently with a DPI approach




*Sources in Annex*

# DPI components unblock information and resource flows to enable measurable service improvements

| | DPI components | Impact on PFM bottlenecks<br>*Information and resource flows* | Impact on service delivery |
|---|---|---|---|
| Solo | Registries & identities | Eliminates duplicate records and verification processes; enables tracking across systems | Nigeria removed 23,846 ghost workers using biometric verification, saving USD 11.5M monthly |
| Solo | Payment systems | Streamlines fund transfers; reduces approval steps; creates traceable payment trails | In Mali, digital payments enabled 99% of vaccinators to receive payment within a week versus months with paper-based systems, building trust in health systems. |
| Solo | Data exchange | Connects siloed systems without rebuilding them; enables real-time visibility across departments | Estonia's X-Road claims annual savings of 2% of GDP through digitized government processes |
| Combinations | Registries & identities + Payment systems | Verified transactions enable targeting of correct recipients, reducing fraud in benefit programs and ensuring payments reach intended beneficiaries | In India, direct benefit transfer systems along with Aadhaar reduced leakage in subsidy programs from 31% to 20%, generating USD 38.5M savings |
| Combinations | Payment systems + Data exchange | Real-time financial management provides visibility across funding sources, enabling faster budget execution and improved resource allocation decisions | WHO implemented mobile money payments to CHWs for carrying out polio campaigns, across 20+ countries. This demonstrated success in payment time ~ in Côte d'Ivoire payment time reduced from 1 month to 24 hours |

*Sources: Digital Impact Alliance. "Co-Develop Booklet Digital." 2024.; Gates, B. "Planes, trains, and smartphones: The future of public infrastructure is digital, efficient, and for everyone." October 15, 2024; World Bank Group. "Digital ID Implementation: Global Insights. Mobile Money, WHO https://rdcu.be/eolip. Biometric Update, "Nigeria uses biometric data and bank verification numbers to remove 24,000 ghost workers from government payroll," March 2016; P2P Foundation, "Estonia's X-Road Project: The Estonian government claims that its digital infrastructure has led to annual savings of about 2% of GDP," 2017*

# Established Frameworks and Further Reading

# Established frameworks offer perspectives on PFM challenges for health service delivery, each illuminating different aspects of the problem

| Framework | Purpose & scope | Assessment of information bottlenecks | Assessment of resource bottlenecks | Assessment of service delivery impact |
|---|---|---|---|---|
| **WHO Health Financing Progress Matrix (HFPM)** | System-level assessment of financing policies to accelerate UHC progress | Structured evaluation of transparency and accountability with specific indicators for budget and financial protection data | Limited assessment of allocation processes; focuses on policy over operational flows | Emphasizes policy improvements rather than connecting financial bottlenecks to service outcomes |
| **WHO Service Availability and Readiness Assessment (SARA)** | Facility-level assessment of capacity to deliver essential health services | Includes data quality review comparing reported data across health system levels | Strong on resource availability; minimal focus on disbursement processes | Directly measures service readiness outcomes without analyzing financial root causes |
| **UNICEF Marginal Budgeting for Bottlenecks (MBB)** | Simulation tool for intervention scaling costs and budgeting implications | Uses HMIS data for baseline scenarios; identifies information system constraints for forecasting | Evaluates resource needs for overcoming bottlenecks; models costs of service delivery modes | Projects how removing bottlenecks affects coverage outcomes; primarily forward-looking |
| **World Bank FinHealth Toolkit** | Practical diagnostics of PFM constraints affecting service delivery at facility level | Examines expenditure reporting and monitoring between facilities and ministries | Comprehensive assessment of treasury arrangements and fund flow processes | Links specific PFM bottlenecks directly to service delivery challenges |

*Source*: WHO Health Financing Progress Matrix (2020) https://www.who.int/teams/health-financing-and-economics/health-financing/diagnostics/health-financing-progress-matrix; WHO SARA Reference Manual v2.2 (2015) https://www.who.int/data/data-collection-tools/service-availability-and-readiness-assessment-(sara); UNICEF Marginal Budgeting for Bottlenecks Guide (2020); World Bank FinHealth Toolkit (2022) https://documents1.worldbank.org/curated/en/099191502152313348/pdf/P1551930f15bf400f09a0b0b954409dc97a.pdf

# Further reading (1/3)|PFM in health


- Cashin, C., Bloom, D., Sparkes, S., Barroy, H., & Kutzin, J. (2017). *Aligning public financial management and health financing: Sustaining progress toward universal health coverage*. World Health Organization & Results for Development. https://iris.who.int/bitstream/10665/254680/1/9789241512039-eng.pdf
- Office of the United Nations High Commissioner for Refugees (UNHCR). (2021). *UNICEF public finance toolkit*. United Nations Children's Fund (UNICEF). https://www.unicef.org/media/113276/file/UNICEF-Public-Finance-Toolkit-2021.pdf
- Piatti-Fünfkirchen, M., & Schneider, P. (2019). *FinHealth toolkit: Strengthening public financial management for health in low- and middle-income countries*. World Bank Group. https://documents1.worldbank.org/curated/en/099191502152313348/pdf/P1551930f15bf400f09a0b0b954409dc97a.pdf
- UNICEF. (2022). *Engaging with public financial management challenges in the health sector*. https://www.unicef.org/documents/public-financial-management-challenges-health-sector
- Hadley, S., Hart, T., & Welham, B. (2020). *Review of public financial management diagnostics for the health sector*. ODI. https://media.odi.org/documents/200217_pfm_health_paper_final_web.pdf
- Barroy, H., Dale, E., Sparkes, S. & Kutzin, J. (2018). *Budget matters for health: key formulation and classification issues*. World Health Organization. https://iris.who.int/handle/10665/273000
- International Monetary Fund. (2016). *Public Expenditure and Financial Accountability (PEFA) framework*. https://www.pefa.org/

# Further reading (2/3)|DPI

## DPI-only

- United Nations Development Programme. (2023). *DPI Approach Playbook*. https://undp.org/publications/dpi-approach-playbook
- Centre for Digital Public Infrastructure. (n.d.). *Repository of DPI-related publications*. https://cdpi.dev/read/
- Carnegie Endowment for International Peace. (2023). *What is the DPI approach?* https://carnegieendowment.org/2023/what-is-dpi-approach
- Centre for Digital Public Infrastructure. (n.d.). *Is your system a DPI? (abridged)* https://cdpi.dev/read/
- Massachusetts Institute of Technology. (2023). *What is DPI?* https://mit.edu/dpi

## DPI for Public Financial Management (PFM)

- International Monetary Fund. (2023). *Digital solutions guidelines for public financial management*. https://www.imf.org/en/Publications/TNM/Issues/2023/10/06/Digital-Solutions-Guidelines-for-Public-Financial-Management-537781
- Long, C., Cangiano, M., Middleton, E., & Stewart, J. (2023). *Digital public financial management: An emerging paradigm*. ODI & Public Digital. https://odi.org/en/publications/digital-public-financial-management-an-emerging-paradigm
- ODI & Public Digital. (2024). *Public Finance Hub*. https://odi.org/en/about/our-work/digital-public-finance-hub/
- Middleton, E., Stewart, J., Kenny, A. and Esmyot, J. (2023) *Making public finance digital: Challenges to the emerging digital public financial management paradigm*. ODI Working Paper. www.odi.org/en/publications/making-public-financedigital-challenges-to-the-emerging-digital-public-financialmanagement-paradigm
- Stewart, J., Kahn, L., and Long, C. (2026). *Better software options for public financial management.* ODI Global Working Paper. https://odi.org/en/publications/better-software-options-for-public-financial-management/

# Further reading (3/3)|Digital Govt, DPI4PFM, DPI4Health

## Digital Government


- Nii-Aponsah, Hubert; Dener, Cem; Ghunney, Love E.; Johns, Kimberly D.. (2021). *GovTech Maturity Index: The State of Public Sector Digital Transformation. International Development in Focus*; World Bank. http://hdl.handle.net/10986/36233
- Clark, J., Marin, G., Ardic Alper, O.P., Galicia Rabadan, G.A. (2025). *Digital Public Infrastructure and Development: A World Bank Group Approach. Digital Transformation White Paper, Volume 1;* World Bank. https://hdl.handle.net/10986/42935


## DPI4Health and PFM in Health


- Vital Wave, Co-Develop, PATH. (2023). Digital Public Infrastructure for Health. https://vitalwave.com/case-study/digital-public-infrastructure-for-health/
- ThinkWell. (2024). *Digital public financial management for health resource tracking: Landscaping study for the Bill & Melinda Gates Foundation*. https://thinkwell.global/resource/dpfm-for-hrt/

# Country Annexes

# Key health financing, PFM, and digital statistics across countries

| Country | Population (million), 2023 | GDP per capita, 2023 | Total health expenditure per capita, 2022 | Total health expenditure as % of GDP, 2022 | Govt spending as % of THE, 2022 | Prepaid private spending as % of THE, 2022 | OOP spending as % of THE, 2022 | Development assistance as % of THE, 2022 | Public Expenditure & Financial Acct.* Scores, last available | GovTech* Scores (out of 1), 2022 | Global Digital Health Monitor* Score (out of 5), 2023 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Benin | 14.1 | $ 1,435 | $ 34 | 2.6% | 14% | 7% | 48% | 31% | 52.5/112 | 0.68 | 3 |
| Burkina Faso | 23 | $ 874 | $ 57 | 6.9% | 44% | 4% | 31% | 21% | 62/124 | 0.64 | 3 |
| Cambodia | 17.4 | $ 1,875 | $ 113 | 6.5% | 26% | 5% | 58% | 11% | 62/112 | 0.58 | 2 |
| Cameroon | 28.4 | $ 1,737 | $ 56 | 3.5% | 12% | 4% | 63% | 21% | 54/124 | 0.39 | 3 |
| Eswatini | 1.2 | $ 3,797 | $ 291 | 7.3% | 49% | 13% | 10% | 29% | 60.5/112 | 0.39 | N/A |
| Ethiopia | 128.7 | $ 1,272 | $ 34 | 3.3% | 30% | 5% | 38% | 28% | 74/124 | 0.58 | 4 |
| Ghana | 33.8 | $ 2,260 | $ 87 | 4.5% | 51% | 10% | 27% | 12% | 65/124 | 0.53 | 3 |
| India | 1438.1 | $ 2,481 | $ 78 | 3.3% | 34% | 15% | 51% | 1% | 73.5/112 | 0.94 | 4 |
| Kenya | 55.3 | $ 1,950 | $ 103 | 4.8% | 46% | 11% | 22% | 21% | 86/124 | 0.75 | 2 |
| Laos | 7.7 | $ 2,075 | $ 50 | 2.4% | 30% | 13% | 35% | 23% | 49.5/124 | 0.41 | 3 |
| Malawi | 21.1 | $ 673 | $ 48 | 8.0% | 20% | 6% | 14% | 60% | 59.5/124 | 0.28 | 4 |
| Nigeria | 227.9 | $ 1,621 | $ 85 | 3.9% | 14% | 4% | 76% | 6% | 53/124 | 0.50 | 2 |
| Rwanda | 14 | $ 1,000 | $ 66 | 6.8% | 42% | 15% | 11% | 33% | 95/124 | 0.68 | 3 |
| South Africa | 63.2 | $ 6,253 | $ 604 | 9.0% | 58% | 32% | 5% | 4% | 99/112 | 0.56 | 3 |
| Zambia | 20.7 | $ 1,369 | $ 79 | 5.2% | 49% | 1% | 9% | 41% | 77.5/124 | 0.55 | 3 |
| Zimbabwe | 16.3 | $ 1,592 | $ 29 | 1.5% | 2% | 0% | 0% | 98% | 57.5/124 | 0.46 | 3 |

Note: * Further description of indices on following slide.

*Source*: World Bank (2024), World Development Indicators; IHME (2024), Global Expected Health Spending 2022-2050; Public Expenditure and Financial Accountability (PEFA) program scores; World Bank (2022) GovTech Maturity Index; Global Digital Health Monitor (2023)

# Description of indices

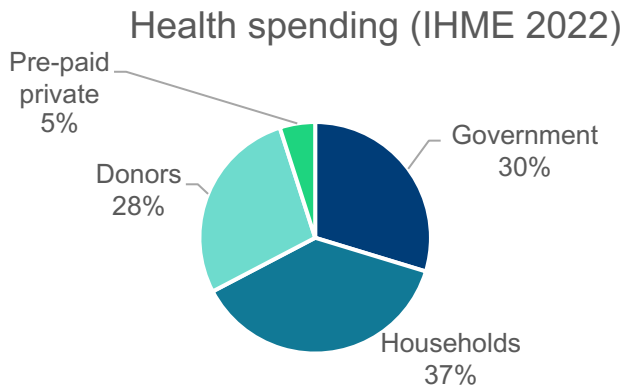
| Index & Purpose | Components |
|---|---|
| ***Public Expenditure & Financial Accountability (PEFA)***<br><br>Indicators used globally to assess strengths and weaknesses of PFM systems to guide improvements. | • **Budget Reliability** (3 indicators) assesses whether the government's budget is realistic and implemented as intended<br>• **Transparency of Public Finances** (6 indicators) measures how much information on public finances is available to the public<br>• **Management of Assets and Liabilities** (4 indicators) focuses on how the government manages financial and non-financial assets and liabilities<br>• **Policy-Based Fiscal Strategy and Budgeting** (5 indicators) evaluates the extent to which the budget is prepared with a fiscal strategy and policy priorities<br>• **Predictability and Control in Budget Execution** (8 indicators) assesses the effectiveness of budget execution and controls<br>• **Accounting and Reporting** (3 indicators) looks at how well financial data is recorded, reported, and audited<br>• **External Scrutiny and Audit** (2 indicators) examines the role of external audit and the legislature in holding the government accountable |
| ***GovTech Maturity Index (GTMI)***<br><br>Index used to measure how governments use digital technology to improve public services, internal operations, and citizen engagement. | • **Core Government Systems Index** (17 indicators) captures the key aspects of a whole-of-government approach<br>• **Public Service Delivery Index** (9 indicators) presents the state of online portals, e-filing services, e-payment capabilities and more<br>• **Digital Citizen Engagement Index** (6 indicators) measures aspects of public participation platforms, citizen feedback, and open gov/data portals<br>• **GovTech Enablers Index** (16 indicators) captures strategy, institutions, and regulations, as well as digital skills and innovation programs |
| ***Global Digital Health Monitor (GDHM)***<br><br>Dynamic web-based public good that aids countries in prioritizing and monitoring their digital health investments. | Consists of 23 standard indicators aligned to the WHO/ITU eHealth Strategy Toolkit and WHO Global Strategy on Digital Health:<br>• **Leadership, governance, AI and emerging technology, & equity**<br>• **Strategy & investment**<br>• **Legislation, policy & compliance**<br>• **Workforce**<br>• **Standards & interoperability**<br>• **Infrastructure**<br>• **Services & applicatio**ns |

# Ethiopia: Health Financing, Systems, & PFM Context

## Health Financing & Systems Context

**Key statistics**

- GDP per capita: US$1,272 – lower-middle income
- Govt allocation to health: 12.5% of govt budget (2023)




**Health system structure**

- Highly decentralized health system, with significant autonomy at regional level
- Strong focus on primary health care as enabler of UHC

**Key health financing reforms & priorities**

- Community-based health insurance is being expanded to improve financial protection and resource pooling
- Capitation reform to improve predictability and availability of funds for facilities, to improve quality and address stock-outs
- Strategies being explored to sustainably finance exempted services (PHC services meant to be free at point of care)

## Public Financial Management Context

**Key statistics**

- **Absorption of health budget**: 88% (2023)
- **PFM systems used**: IFMIS, IBEX, Peachtree accounting

**PEFA scores**: 75/124 (2019)

| Pillar | Score |
|---|---|
| Budget reliability | D+ |
| Transparency of public finances | B |
| Management of assets and liabilities | C |
| Policy-based fiscal strategy and budgeting | C+ |
| Predictability and control in budget execution | C |
| Accounting and reporting | C |
| External scrutiny and audit | B |

# Ethiopia: Digital Context

## Digital ID

Ethiopia's National ID Program (NIDP) rolling out digital ID system, **Fayda**

## Payments

National payment system stewarded by National Bank of Ethiopia (EthSwitch), at scale

## Data Exchange

Data exchange based on X-Road being developed

## Other health-related DPIs

- Master facility list under development

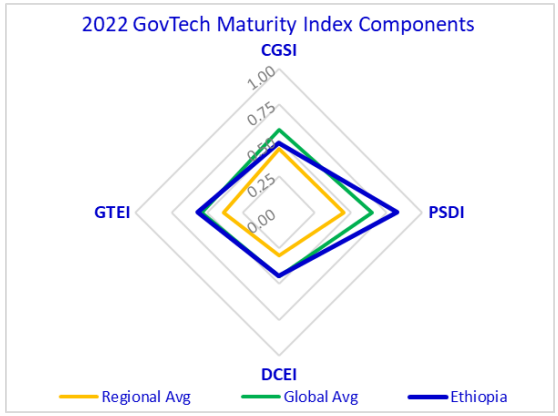
## Enabling environment for continued digital / DPI investments

### Digital Maturity

- 19.4% internet penetration
- 128.5 million mobile money accounts
- More than 587 digital government and trade platforms introduced to aid digital transformation efforts, with further World Bank backed efforts to drive data centre development

### Digital Governance

GovTech Grade B Maturity country




### Policy environment

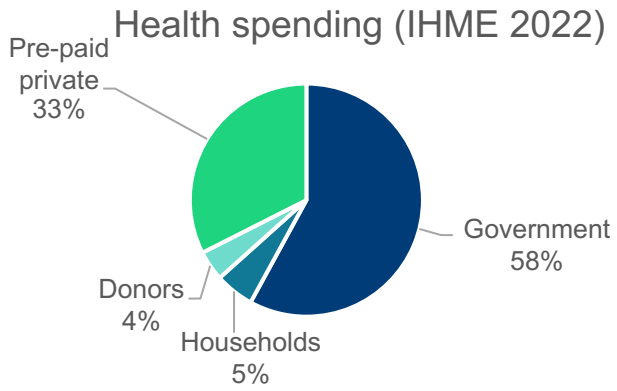
- Digital health strategy and enterprise architecture
- Health financing information system reform
- National Digital Payment Strategy (2021-2024)
- Digital Ethiopia 2025 strategy outlines plans to leverage digital technologies across various sectors

# Burkina Faso: Health Financing, Systems, & PFM Context

## Health Financing & Systems Context

**Key statistics**

- GDP per capita: US$872 – low-income
- Govt allocation to health: 11.5% of govt budget (2023)




**Health system structure**

- A highly decentralized system where health facilities have a degree of autonomy in managing their financial resources, while districts and regions have autonomy in developing their action plans and budgets.

**Key health financing reforms & priorities**

- The government is scaling up its flagship Gratuité program initiated in 2016, which provides free SRMNCH services to ≃ 5 million women, newborn, and children nationwide, and is expanding to other groups.
- The government is implementing a nationwide one plan, one budget, one report reform to address fragmentation in external funding and inform domestic allocations for the health sector.

## Public Financial Management Context

**Key statistics**

- **Absorption of health budget**: 98.6% (2023)
- PFM systems used: E-flux (financial management); FIS (billing of the Gratuité program); Circuit Intégré de la Dépense (CID)

**PEFA scores**: 62/124 (2017)

| Pillar | Score |
|---|---|
| Budget reliability | D+ |
| Transparency of public finances | C+ |
| Management of assets and liabilities | C+ |
| Policy-based fiscal strategy and budgeting | C+ |
| Predictability and control in budget execution | C |
| Accounting and reporting | C |
| External scrutiny and audit | D |

# Burkina Faso: Digital Context

## Digital ID

MOSIP-based Digital ID system being piloted and rolled out

## Payments

FAZO ARZEKA – national digital payment platform, launched in Jan 2025

## Data Exchange

Agence Nationale de Promotion des TIC coordinated data exchange implemented cross-sectorally

## Other health-related DPIs

- Common Geo-registry (IASA)
- Master Facility List
- CHW master list (digital register)
- Health map/carte sanitaire

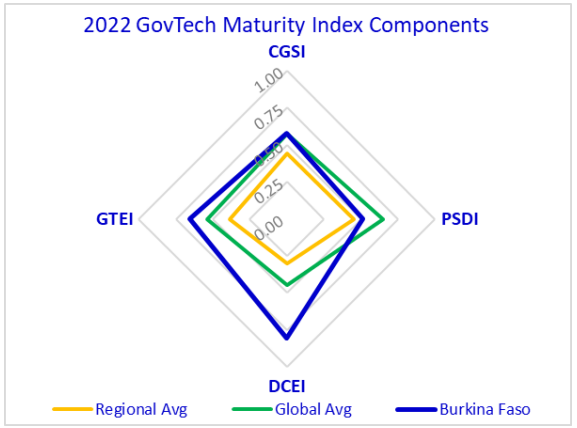
## Enabling environment for continued digital / DPI investments

### Digital Maturity

- 20% internet penetration
- 33% mobile money penetration
- However, Burkina Faso is aiming to improve connectivity with the installation of 800 telecom towers over the next year, with the overall goal of widespread connectivity by 2027

### Digital Governance

GovTech Grade B Maturity country




### Policy environment

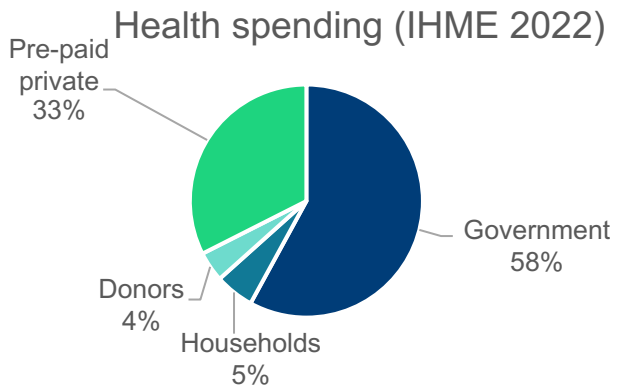
- National Health Development Plan (PNDS) includes a National Health Information System (SNIS) 2022-2025 strategic plan focused on improving digital health, incl. improvements to interoperability

# South Africa: Health Financing, Systems, & PFM Context

## Health Financing & Systems Context

**Key statistics**

- GDP per capita: US$6,253 – upper-middle income
- Govt allocation to health: 12% of govt budget




**Health system structure**

- Highly decentralized health system, with most decisions made at sub-national levels (provincial, district, facility)

**Key health financing reforms & priorities**

- National Health Insurance reform underway, to move towards UHC and greater equity, incl. strategic purchasing from public and private providers
- Provincial government efforts to address inequity and inefficiency in health spending, by increasing fiscal transparency and improving decentralized decision-making through data availability and granularity

## Public Financial Management Context

**Key statistics**

- **Absorption of health budget**: 120% (over-expenditure), 2023 (differs by province). Provincial health spending deficit: R13,84bn (FY 2023/24)
- PFM systems used: BAS, LOGIS, PERSAL, Vulindlela

**PEFA scores**: 99/112 (2014), relatively high for region

| Pillar | Score |
|---|---|
| Credibility of the Budget | A |
| Comprehensiveness and Transparency | A |
| Policy-Based Budgeting | B+ |
| Predictability and Control in Budget Execution | B |
| Accounting, Recording and Reporting | B+ |
| External Scrutiny and Audit | B+ |
| Credibility of the Budget | A |

# South Africa: Digital Context

## Digital ID

Unique national ID widely implemented, with discussions for digital IDs

## Payments

PayShap co-created by Treasury and consumer banks. Low-value, RTP

## Data Exchange

Data exchange standards created (CoA etc.). SITA controlled data exchange platform

## Other health-related DPIs

- MoH-controlled Master Facility Register

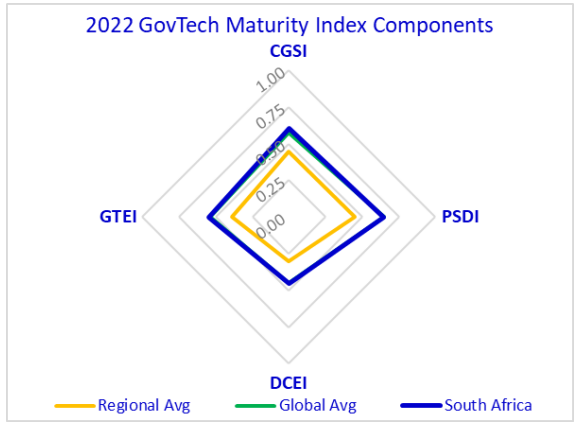
## Enabling environment for continued digital / DPI investments

### Digital Maturity

- 78.6% of South Africans have access to the internet, largely driven by increasing mobile penetration and large investments in fibre infrastructure
- South Africa is establishing itself as a data centre hub for Africa, driven by an increasing demand for cloud services, big data analytics and digital platforms

### Digital Governance

GovTech Grade B Maturity country




### Policy environment

- Interdepartmental working group created to develop a DPI strategy and implementation roadmap
- National Digital Skills Strategy created and currently being implemented
- National AI Policy Framework

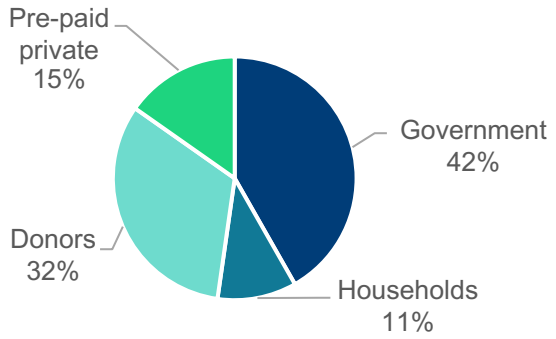
# Rwanda: Health Financing, Systems, & PFM Context

## Health Financing & Systems Context

**Key statistics**

- GDP per capita: US$1,000 (low income)
- Govt allocation to health: ~8% of govt budget (2023)

Health spending (IHME 2022)




**Health system structure**

- Highly centralized health system, incl. central planning and budgeting

**Key health financing reforms & priorities**

- PHC reforms underway to bring services closer to patients and improve quality, including a national community health reform and broader PHC workforce reform given shortages
- CBHI covers 91% of Rwandans for an expanding package of services; reforms underway to improve sustainability, incl. rollout of capitation
- A new health policy unit set up in MoH to bring evidence to senior policy makers to shape policies, including to drive down persistently high maternal and neonatal mortality

## Public Financial Management Context

**Key statistics**

- **Absorption of health budget:** 94% (2022)
- **PFM systems used:** IFMIS operates down to district hospital level; other systems including iHBS used for claims mgmt.

**PEFA scores**: 95/124 (2017), relatively high for income level and region

| Pillar | Score |
|---|---|
| Budget reliability | C+ |
| Transparency of public finances | B |
| Management of assets and liabilities | B |
| Policy-based fiscal strategy and budgeting | B+ |
| Predictability and control in budget execution | B+ |
| Accounting and reporting | C+ |
| External scrutiny and audit | C+ |

# Rwanda: Digital Context

## Digital ID

NIDA (National Identification Agency) ID system

## Payments

Widely used to promote a cashless economy (e.g., eKash/RSwitch; mobile e-wallets via telecoms/banks)

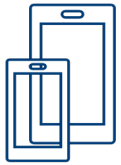
## Data Exchange

Irembo as major exchange platform w/ >100 govt services available, incl. CBHI enrollment

## Other health-related DPIs

- Health facility master list
- Patient ID being developed (to be linked to national ID)
- Health worker registry/system under development (Health Worker Portal)

## Enabling environment for continued digital / DPI investments

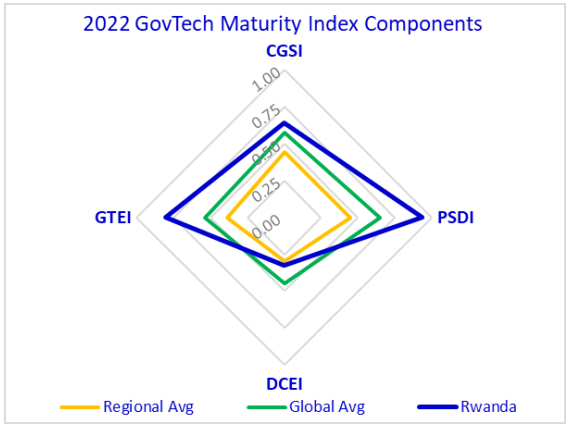


### Digital Maturity

- 58.3% internet penetration
- 86% penetration of mobile money
- Rwanda is establishing itself as a leader in digital transformation and digital government, significantly outperforming regional and global averages.

### Digital Governance

GovTech Maturity Grade B




### Policy environment

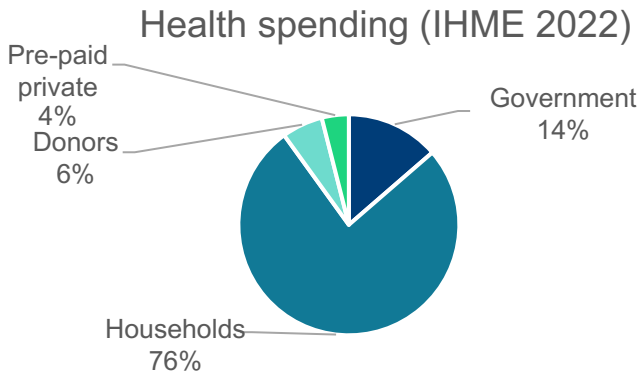
- The Digital Health Strategic Plan lays out the specific digital health agenda to improve information exchange, patient care; The Smart Rwanda Master Plan provides a plan for transition to a knowledge-based economy.
- 8 govt priority systems being scaled *(National Health Intelligence Center, the Health Insurance Portal, emergency response information system, the community health workers information system, enhanced electronic medical record system (Facility EMR), the citizen health app, the national medical laboratory information system, and genomic surveillance information system)*

# Nigeria: Health Financing, Systems, & PFM Context

## Health Financing & Systems Context

**Key statistics**

- GDP per capita: $1,621 – lower-middle income
- Govt allocation to health: 5% of government budget (2023)




**Health system structure**

- Federalized country; states have significant autonomy in healthcare provision, inequities across states

**Key health financing reforms & priorities**

- Sector-Wide Approach being initiated at federal level to improve coordination across donors and government towards health sector priorities
- States aiming to improve enrollment, sustainability, and functionality of Vulnerable Populations Programs set up to extend health insurance to vulnerable groups
- Federal government is aiming to expand subsidy program that funds a basic minimum package of PHC services (Basic Healthcare Provision Fund)

## Public Financial Management Context

**Key statistics**

- Budget execution in health: 53% (high underspend of government budget)
- PFM systems used: GIFMIS (federal + state adapted), Treasury Single Account (federal + some states), IPSAS, state-specific insurance management system and tools

**PEFA scores**: 53/124 (2019)

| Pillar | Score |
|---|---|
| Budget reliability | D+ |
| Transparency of public finances | C |
| Management of assets and liabilities | C |
| Policy-based fiscal strategy and budgeting | D+ |
| Predictability and control in budget execution | C |
| Accounting and reporting | D+ |
| External scrutiny and audit | D |

# Nigeria: Digital Context

## Digital ID

Gradual rollout of National ID number, linked to BVN. Fragmented implementation across states; some state-specific IDs

## Payments

Interbank payment and settlements implemented (eg. NIBSS & Remita). Multiple mobile money operators

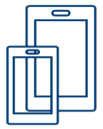
## Data Exchange

No government owned and operated data exchange mechanism. Plans in place for HIE

## Other health-related DPIs

- Master Health Facility Lists
- Master HRH Lists
- However, the above lists are not regularly updated or interoperable with other systems

## Enabling environment for continued digital / DPI investments

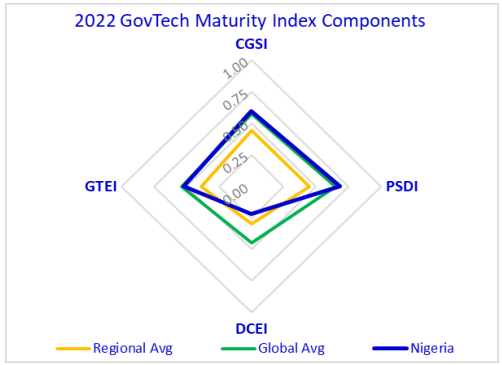


### Digital Maturity

- Internet connectivity varies across states, dependent on socioeconomic factors amongst others
- 4G Network Coverage extends across the entire country, but internet penetration only extends to approximately 45% of the population

### Digital Governance

GovTech Maturity Grade B




### Policy environment

- **National Digital Economy Policy and Framework** – aims to leverage the use of digital transformation to stimulate the Nigeria economy and improve the lives of Nigerian citizens
- **3MTT** – aims to train three million talented individuals to harness their tech skills across 12 high impact areas

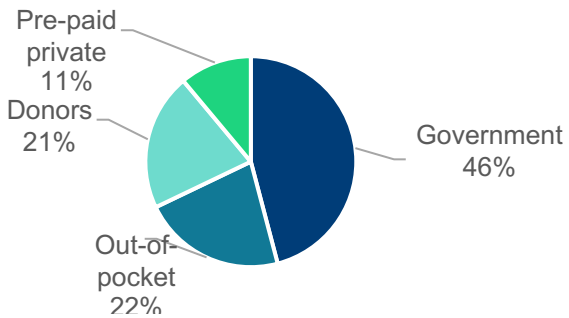
# Kenya: Health Financing, Systems, & PFM Context

## Health Financing & Systems Context

**Key statistics**

- GDP per capita: $1,950 – lower-middle income
- Govt allocation to health: 9.7% of government budget (2023/24)

Health spending (IHME 2022)




**Health system structure**

- Highly devolved with 47 Counties having significant autonomy and therefore significant variation between county spending on health, autonomy of facilities to retain revenues, etc.

**Key health financing reforms & priorities**

- Facility Improvement Financing enshrines facility autonomy in planning, budgeting and utilization of funds collected at facility level
- To extend UHC, Social Health Insurance law established Social Health Authority which will govern three Funds: PHC Fund for PHC services; Social Health Insurance Fund for general insurance; Emergency and Chronic Care Fund
- Primary Health Care Act to reform the PHC model by establishing Primary Care Networks

## Public Financial Management Context

**Key statistics**

- Absorption of health budget: 82% (underspend of national health budget, 2015-2017)
- PFM systems used: IFMIS used at National and County level
  - PFMS reforms underway to roll out new integrated ERP
  - No current linkage between KHIS and IFMIS

**PEFA scores: 86/124 (2019)**

| Pillar | Score |
|---|---|
| Budget reliability | B |
| Transparency of public finances | C+ |
| Management of assets and liabilities | C+ |
| Policy-based fiscal strategy and budgeting | B |
| Predictability and control in budget execution | B |
| Accounting and reporting | C+ |
| External scrutiny and audit | B |

# Kenya: Digital Context

## Digital ID

Maisha number being rolled out

## Payments

M-Pesa, PesaPal, EquiTel
Govt digital payments through eCitizen

## Data Exchange

eCitizen as major government platform
X-Road proposed as data exchange

## Other health-related DPIs

- Health facility master list
- Client registry
- Health worker registry
- Community Health Unit Registry

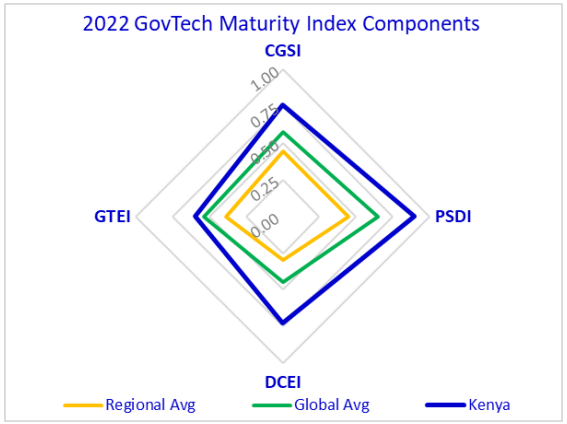
## Enabling environment for continued digital / DPI investments

### Digital Maturity

- Internet penetration rates stands at 40.8%, or over 22 million people in Kenya
  - Increased rates of taxes on mobile airtime and data could influence this in the coming years
- There are more than 73 million mobile money accounts in the country, exceeding the population number
  - 59% of Kenya's GDP flows through M-Pesa

### Digital Governance

GovTech Maturity Grade B+




### Policy environment

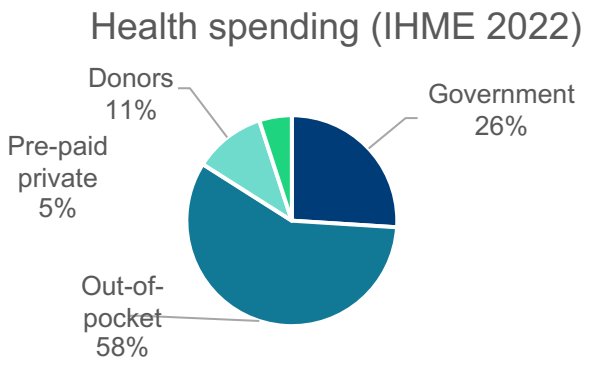
- The **Digital Health Superhighway** lays out digital health agenda to improve interoperability across digital health systems. This includesde formation of the Digital Health Authority (governing body of digital health initiatives in the government) and Integrated Health Information Technology System

# Cambodia: Health Financing, Systems, & PFM Context

## Health Financing & Systems Context

**Key statistics**

- GDP per capita: $1,875 – lower-middle income
- Govt allocation to health: 11.7%




**Health system structure**

- Centralized system, with policy development and programs being decided nationally. Gradual shift to decentralization.

**Key health financing reforms & priorities**

- Government of Cambodia's priority is decreasing OOP, progress towards UHC moving from 58 to 80 on UHC index; has been detailed/endorsed by the PMO. UHC Roadmap released gives National Social Protection Council core mandate to harmonize social protection and increase coverage and adequacy of benefits to all Cambodians
- Effort/vision to include private sector as part of the social security net for vulnerable populations – to improve coverage/accessibility since a lot of the OOP is driven by utilization of private sector facilities

## Public Financial Management Context

**Key statistics**

- Absorption of health budget: 82.4%
- PFM systems used:
  - IFMIS used at the national level with linkages to all line ministries

**PEFA scores:** 62/112 (2015)

| Pillar | Score |
|---|---|
| Credibility of the Budget | C+ |
| Comprehensiveness and Transparency | C |
| Policy-Based Budgeting | B+ |
| Predictability and Control in Budget Execution | C |
| Accounting, Recording and Reporting | C |
| External Scrutiny and Audit | C+ |

# Cambodia: Digital Context

## Digital ID

Fragmented identity systems – with ongoing work to establish a single Social Protection ID

## Payments

Strong payments infrastructure with Bakong – widely used and adopted

## Data Exchange

Promising data exchange system – CamDX. Limited use at the moment

## Other health-related DPIs

- Geo-enabled health facility master list
- CHW master list (Malaria specific)

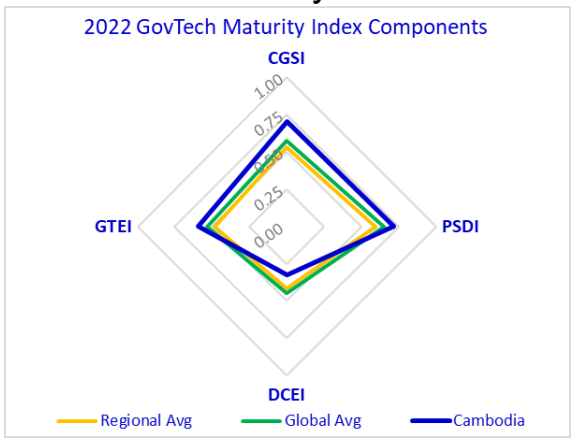
## Enabling environment for continued digital / DPI investments

### Digital Maturity

- Smartphone penetration is high across Cambodia, with 20 million mobile phone subscribers (for just a 16.7m population)
- Rapid increase in the last decade – associated with rapid increase in digital literacy

### Digital Governance

GovTech Maturity Grade B




### Policy environment

- Cambodia's Digital Government Policy (2022-2035) demonstrates commitment to coordinated digital transformation at Prime Ministerial level
- UHC roadmap launched with a strong interest from the General Secretariat for National Social Protection Council to move toward establishing and investing in foundational identity and data exchange systems

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