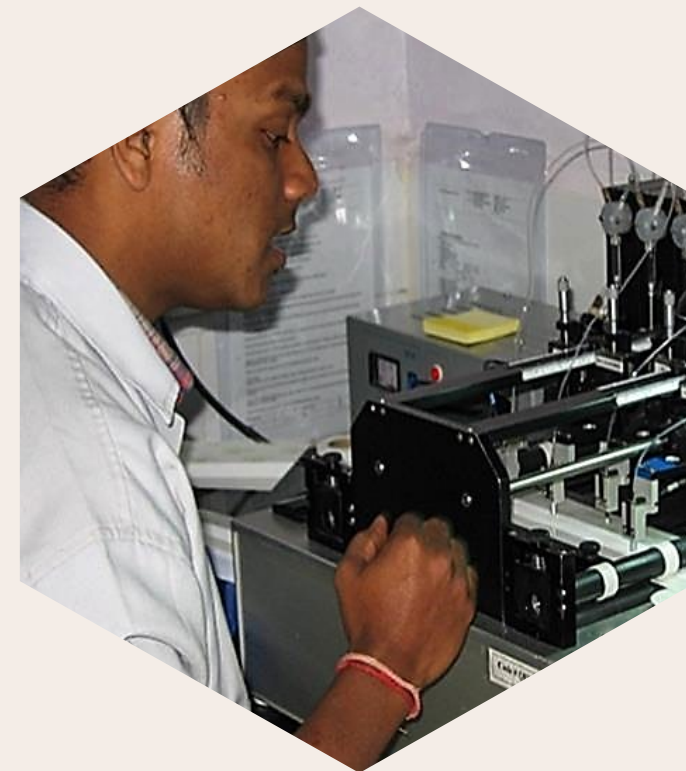


Lessons from the Field: Deploying Emerging Technologies for NCD Screening and Management



About PATH

A global nonprofit improving public health



70+ countries
where PATH is improving health



7 million lives saved
through PATH-pioneered malaria control



900 million people
reached with fortified rice



7 billion
vaccine vial monitors

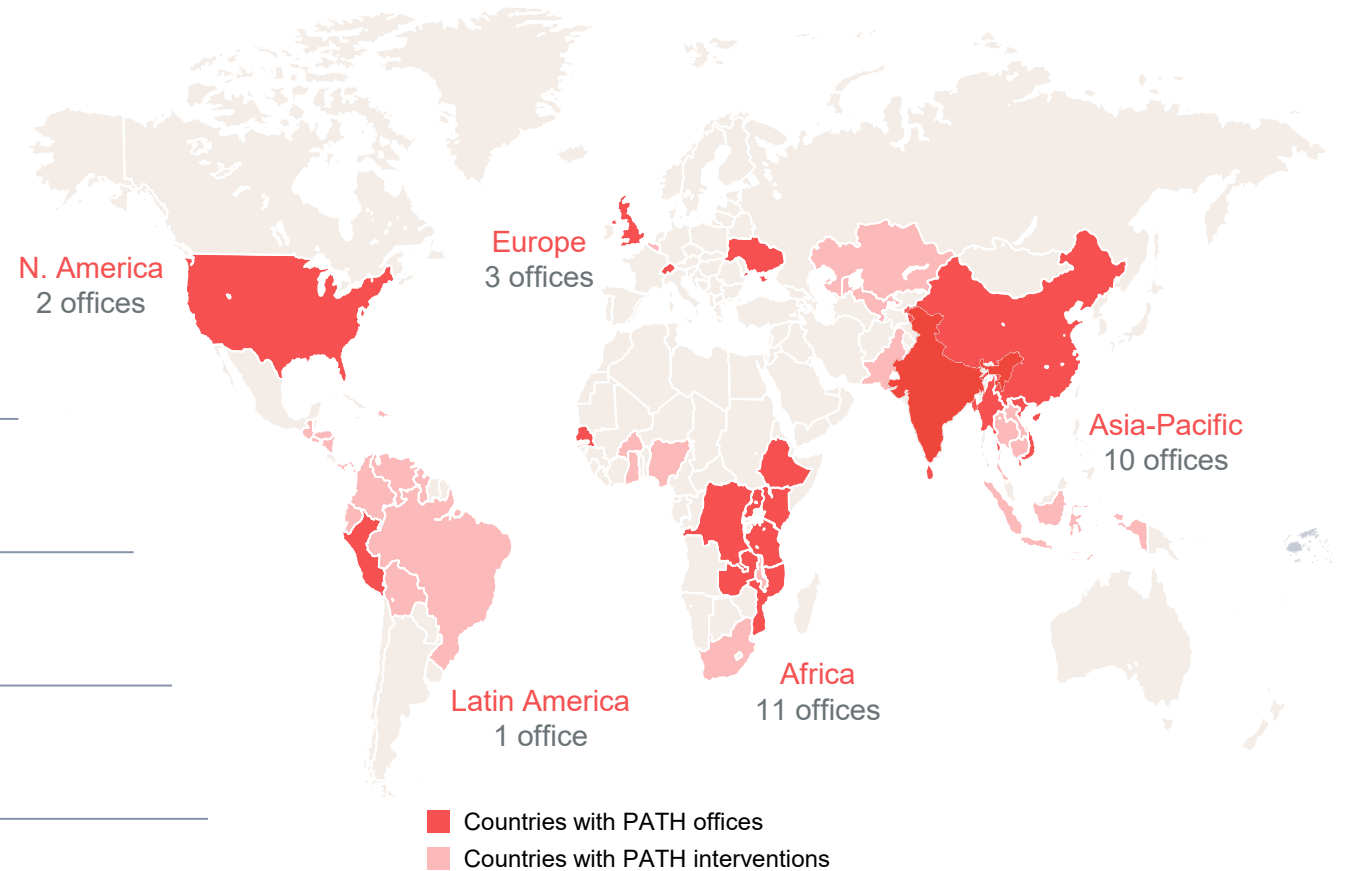


3200 professionals
globally



World's first freeze-preventive cold box
Received WHO PQ (field trials in Nepal)

27 offices in 24 countries



NCDs & Technologies: The Why & How



Burden of NCDs in Asia Pacific

NCDs are responsible for 7 of the top 10 leading causes of mortality and account for 28 premature deaths every minute globally

43M

Deaths attributed to NCDs in 2021. Of these **18M** occurred in the ages of 30-70 ^[1]

\$47 trillion

the global cost of lost productivity from the four major NCDs** plus mental health conditions, between 2011 and 2030 ^[2]

** Cardiovascular diseases, cancer, diabetes, chronic respiratory diseases

¹ WHO, 2024. *Noncommunicable Diseases*

² WHO. 2022. *Invisible Numbers: The True Extent of Noncommunicable Diseases and What to Do about Them*. Geneva.

Challenges in NCD Care



Significant Differences in Clinical and Care Pathways



Inadequacy of infrastructure



High cost



Economic Costs to Countries



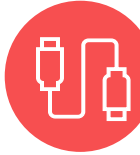
Insufficient Quality of Care



Scarcity of trained human resources



Limited access to specialist care



Limited Access to Digital Health Technologies



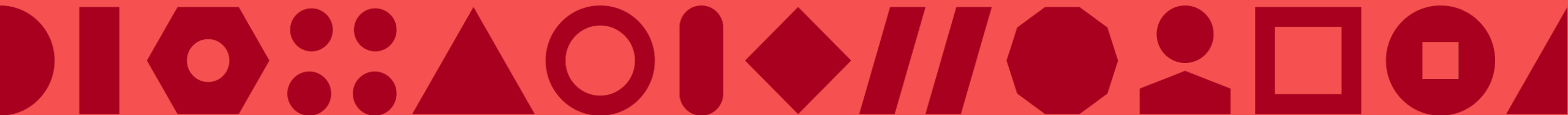
Poor adherence to medication



Lack of integration of health services

A strengthened, technology-enabled, and comprehensive primary health care system

- Provides cost-effective quality of care in resource-limited settings
- Achieves universal health coverage (UHC) and Sustainable Development Goals
- Medical devices and innovative health technologies is critical in the fight against NCDs - Global Action Plan for the Prevention and Control of NCDs (2013–2020, extended until 2030)



Areas of Health Technology Interventions for better NCD Care



Screening and early detection

Rapid point-of-care tests and digital health tools often enabled by AI –

- Improves access to early detection, and
- Allows timely interventions for better health management



EHR and health information exchange platforms

Streamlines patient data storage

Improves data management

Ensures accessibility and easily transferability of patient records

Assists health-care providers in enhancing overall quality of care



Wearable devices and remote monitoring

Enable patients to **track health indicators** and **share real-time data** with their health-care providers

Instant biofeedback, especially with NCDs, through continuous monitoring



Innovative technologies for health workforce training

Technology innovations drive change in the PHC system's workforce.

Digital tools will reengineer the health systems

Huge potential for enhancing the capacity of the health workforce



Telemedicine

Malaysia's **MYSejahtera** – initially a COVID-19 contact tracing app – has integrated teleconsultation services

India's **eSanjeevani** is enabling digital health equity and achieving UHC

Social media platforms are used in many countries for appointment scheduling, teleconsultations, and e-prescriptions

Scaling Technology Innovations: PATH South Asia Experience



Impact Lab: 'Go-to-Platform' for Scaling-up Innovations

Impact lab ecosystem comprises:

- Public sector
- Regulatory bodies
- Innovators/Researchers
- Incubators/Accelerators
- Industry

Impact lab supports:

- Validation
- Usability, Feasibility, Acceptability Evaluation
- Deployment
- Evidence generation
- Market access and Scale-up of health technology innovations
- Conduct knowledge convenings, workshops and roundtables



Programmatic Areas:

Primary Healthcare - NCDs



AI enabled Stethoscope



Smart Spirometer

Maternal, Newborn and Child Health



Smart fetal monitoring

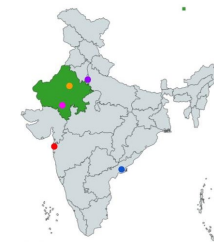


Non-invasive Hb testing

Infectious Diseases

Immunization & Cold Chain Devices

Climate X Health



Community Health Integrated Platform



Medical grade portable refrigerators

PATH Supported Deployments for NCD Screening and Management at Primary Health Care

By uniting global stakeholders including governments, health agencies, donors, and private sector entities, PATH provides a vital platform for advancing impactful solutions and driving positive change in public healthcare systems worldwide.

Connecting innovations to impact



Mythri Lite (Niramai Health Analytix) - Non-invasive Breast cancer screening



Alveoair (Alveofit)* - AI based Spirometer



qXR (Qure.ai) - AI based CAD for Chest X-ray



AiSteth (Ai Health Highway) - AI based Stethoscope



SAVE (Briota Technologies)* - PFT in a Box – Spirometer with Teleconsultation



Smartscope (Periwinkle Technologies) - Cervical screening



AH-MX (Acare Technology) – Handheld Pulse Oximeter



EzeCheck (EzeRx Health Tech)* - Non-invasive point-of-care Hb testing



Swoop (Hyperfine, Inc)* - Portable ultra-low field MRI for brain imaging




*Assessments supported by PATH

Case Study: Cervical health screening by SMART Scope (Periwinkle)

AI-supported comprehensive single visit solution for cervical health screening

Naked eye, VIA-based cervical cancer screening faces challenges such as skill-dependent accuracy, low confidence, lack of remote review options, and logistical issues with acetic acid preparation

SMART Scope

-  Provides consistent images with uniform illumination without the need for electricity, space, other infrastructure.
-  Telehealth software that facilitates secure digital records with review and consultation remoted.
-  An AI to analyze the images to provide a risk stratification.



CLINICAL RESULTS

- **Sensitivity:** ~90%
- **Specificity:** ~80%



ADVANTAGES

- Easy screening of cervical abnormalities
- Advance technology for point-of-care technology
- Better quality of care
- Instant visual report for patient counselling
- Single visit test



- The device is deployed across 12 healthcare facilities in Satara, Maharashtra, India – 1 District Hospital, 1 Regional Hospital, 11 PHCs.
- It is also used for routine cervical health screening at facility level & at women health camps.

ADB & PATH: Technology for NCDs and Mental Health

TA by PATH intends to bridge the gaps in primary health care access with technologies to enhance screening, diagnosis, self-care, and management of NCDs and mental health conditions for communities in primary healthcare settings.

Landscaping of **technology-based solutions for screening, diagnosis, and management of NCDs** relevant the Asia Pacific region. Published as **ADB's knowledge brief.**

Developed a **searchable directory of relevant applicable technologies** based on the landscaping exercise.

Innovation Challenge to identify two innovative, scalable technologies that enhance person-centered, high-quality care for NCDs and mental health

Feasibility assessment of NCD technology

Conference and Creation of Knowledge Products

NO. 301 MAY 2024

ADB BRIEFS

Integrated Primary Care Technologies for Noncommunicable Diseases and Mental Health in Asia and the Pacific

KEY POINTS

- Major noncommunicable diseases, including mental health conditions, contribute to 70% of deaths globally every year. 67% of deaths in Southeast Asia, and 89% of deaths in the Western Pacific, thereby causing a high burden in the health systems and economic welfare.
- Strengthening primary health care with quality and affordable medicines and health technologies is crucial for achieving universal health coverage and Sustainable Development Goals. Integration of digital technology can also promote networks between primary care and specialist health-care providers.
- Technology-driven initiatives at primary care level can include screening and early detection, surveillance, disease monitoring, electronic health records and health information exchange platforms, and technologies for health workforce training.
- The repository of health technologies is intended as a guide for developing member countries in Asia and the Pacific to identify potential solutions that can bridge gaps in the continuum of care for noncommunicable diseases and mental health management at the primary care level.

INTRODUCTION

The Global Health Estimates 2019 of the World Health Organization (WHO) indicate that noncommunicable diseases (NCDs), including mental health conditions, contribute about 68% to the overall disease burden, measured using the disability-adjusted life years. The global cost of lost productivity from the four major NCDs—cardiovascular diseases, cancer, diabetes, and chronic respiratory diseases—is estimated at \$125 trillion between 2019 and 2030, and increases to \$147 trillion with the addition of mental health conditions. NCDs, including mental health conditions, account for 70% of the world's disease burden of deaths in Southeast Asia, and 89% in the Western Pacific.

The burden from NCDs and mental health is rising rapidly in the Asia and Pacific region. A strengthened, technology-enabled, and comprehensive primary health care (PHC) system is a prerequisite in providing cost-effective quality of care in resource-limited settings and in achieving universal health coverage (UHC) and Sustainable Development Goals.

Notes: This brief is part of the regional technical assistance of the Asian Development Bank (ADB), Strengthening Integrated Primary Health Care Management of Noncommunicable Diseases, under ADB Finance and Social Development Office, Sector Group. Authors also acknowledge the support and contributions of the following: Philippine Health and Welfare Department, Department of Health, National Health and Medical Research Council, and the Department of Health, National Health and Medical Research Council, and the Department of Health, National Health and Medical Research Council.

Authors: Yasuhiro S. Yunggrasamee, Jee Eun Kim, Michelle Agostini, Patrick Ochoa, Harman and Social Development Office, Asian Development Bank. **Project Lead:** Rakesh Raju, Durga Vaidya, Rakesh Raju, Harman and Social Development Office, Asian Development Bank.

ADB

PATH

CANCERS

Level of Care: All Country of Origin: All Category: All Principle: All Disease Type: All

Total Technologies

| Level of Care | Country of Origin | Category | Principle | Disease Type |
|---------------|-------------------|----------|-----------|--------------|
| 17 | | | | |
| 4 | | | | |
| 11 | | | | |
| 2 | | | | |

Technology Device

| Technology Device | Company Name | Technology Link | Disease Type | Description |
|-------------------------------------|------------------------|-----------------|-----------------|---|
| AVI Malignant | ICMR | | Cervical Cancer | A device for visualizing the pre-cancerous and cancer lesions of cervix and oral cavity |
| Cervicam C30 | TelCervico | | Cervical Cancer | A TelCervico system for cervical cancer screening |
| SmartScope | Perinatal Technologies | | Cervical Cancer | AI based product for cervical health testing |
| Dr. Onoscope | Dr. Onoscope | | Oral Cancer | App based detection oral cancer |
| IndoScreen Ultra | IndoScreen | | Cervical Cancer | Cervical cancer screening device |
| POCCT | Calla Health | | Cervical Cancer | Colposcope for Use in Resource Limited Settings |
| Mydri Thermalis | Nizami | | Breast Cancer | Developer of AI based early stage breast cancer screening device |
| BIOONFA multi cancer detection test | Yipio Bio | | Cervical Cancer | Developer of diagnostic tests for the detection of cancer |
| Cervicam | Silena | | Cervical Cancer | Developer of screening device for the detection of cancer - cervical |
| OralScan | Silena | | Oral Cancer | Developer of screening device for the detection of cancer - oral |

Technologies' offering Primary & Tertiary Care

Primary: 12 Tertiary: 5

Technologies' working on Particular Principles

| Principle | Count |
|--|-------|
| Cervical cancer screening | 5 |
| Oral cancer screening device | 2 |
| Breast cancer screening | 1 |
| Breast cancer detection | 1 |
| Cervical cancer detection | 1 |
| Disposable pads with fluorescence sensor | 1 |
| DNA Methylation Detection for Cervi | 1 |
| Hand held non-invasive device for cervi | 1 |
| Molecular diagnosis of cancer DNA meth | 1 |
| Time-to-tissue cancer detection | 1 |
| Real-time cervical health checkup | 1 |
| Time based to detect cancer | 1 |



'Technologies Beyond Borders' Innovation Challenge to Scout New Technologies

Winner



NON-COMMUNICABLE DISEASES

SAVE™ from Briota

Point of care solution for Chronic Respiratory Diseases such as COPD, Post TB Asthma and ILD at primary health care.

FINALISTS

- ▶ NeoDocs
- ▶ Qure.ai
- ▶ Neopenda
- ▶ AiSteth
- ▶ BrainCapture
- ▶ Scanbo
- ▶ Population NCD AiHealth
- ▶ Alveofit

Feasibility Assessment

To evaluate the **usability**, **acceptability**, and **feasibility** of SAVE™ platform from an **end-user and programmatic perspective**.

The evaluation consisted of two broad activities:

1. **Simulated use and interviews with health care workers** in the different levels of healthcare facilities and in the different administrative zones of Bangladesh - to obtain feedback on the use experience and potential acceptability.
2. **Stakeholder interviews** with technical and programmatic stakeholders - to explore the potential feasibility and fit in the public health program in Bangladesh

Lessons from the Field



Product Readiness to Deployment Readiness

**Healthcare Worker
Assessment for
Technology Operation**



**End User &
Patient Experience**



**Data Storage &
Sharing**



**Self-Testing
Capability**



**Software Licensing
Costs and Parameters**



**Data Reporting for
Public Health Action**



**Minimum Digital
Literacy Level**



**App Updates
(Frequency and
Cost)**



**Repairs/Replacement
Including Batteries**



**Trainings &
Refreshers**



**Biosafety &
Biowaste Management**



**Service
Network**



**Consumables and
Reagents (Sole/Open
Source)**



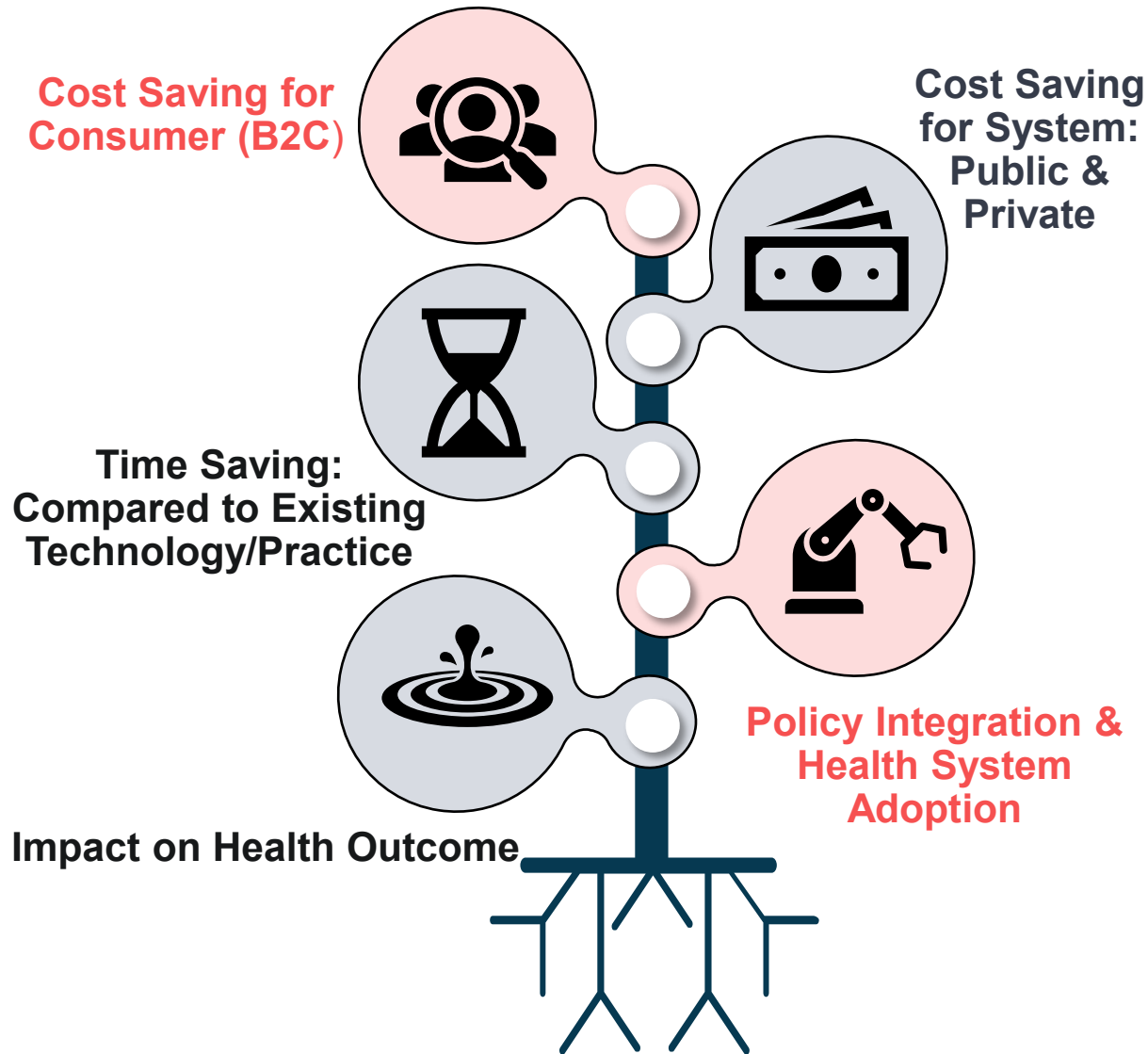
**Programmatic
Fitment**



**Risk
Management**



Deployment Readiness to Health Systems Adoption



Additionally, Innovative Technologies for NCDs should:



Justify Efficiency & Efficacy v/s Competing Priorities



Allow Provisions for Preventive Programs



Manage Referrals & Treatment



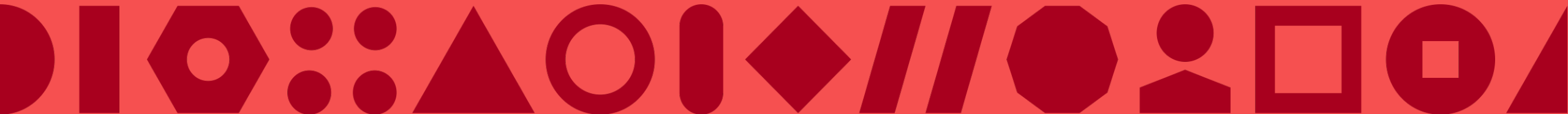
Fill Governance and Accountability Gaps

Thank You

Visit @



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