

Digital transformation of health systems in low-resource settings

How much does sustainability cost?
An interactive thought exercise



Fundamental equation for understanding the cost of providing digitally-enabled health systems to everyone

of people that still need to be reached with comprehensive, digitally-enabled health services



The annual cost, per person reached, to deliver digitally-enabled health services



Total annual cost to sustainably deliver digitally-enabled health services for all

Important considerations in estimating the cost

Digital health maturity varies

For example, in terms of network penetration, digital access, policy and regulatory environment, and digital literacy

Needs vary by digital health maturity level

For example, in terms of necessary attributes (e.g. offline functionality) and implementation considerations (e.g. degree of ongoing training and support)

Needs vary by person

For example, by age, gender, socio-economic status, digital access, affiliation with vulnerable communities

Available data tends to be by project or intervention area

Costing data usually accounts for only a subset of all the digital health interventions, and cost drivers have different denominators

Potential economies of scale aren't well understood

Cost-to-sell and service support can be major cost drivers for software, yet economies of scale could dramatically reduce both

Cost varies by maturity level

For example, lower-maturity deployments will require greater infrastructure and implementation investments

Input 1: # of people that still need to be reached with comprehensive, digitally-enabled health services

Inputs	[user input]	Source data
In what parts of the world would you like to calculate this estimate?	Can select 'global', single or multiple countries; consider adding regional selection options	<i>UNPD World Population Prospects 2019</i>
Are you assuming direct-to-patient digital engagement for populations <15, or will digital engagement be mediated through parents and/or health providers?	Drop-down, forced choice, direct-to-patient digital engagement for <15 OR Mediated for <15	<i>UNPD World Population Prospects 2019</i>

Input 2: The annual cost, per person reached, to deliver digitally-enabled health services

Inputs	[user input]	Source data
What digital health maturity levels do your populations fall into? [M1/2/3]	[automatically calculated based on Input 1]	<i>Global Digital Health Index and Digital Square extension analysis</i>
What per-person cost, in USD, would you like to assume for M1?	Can input any value; recommended range is written below	<i>Benchmarking spreadsheet</i>
What per-person cost, in USD, would you like to assume for M2?	Can input any value; recommended range is written below	<i>Benchmarking spreadsheet</i>
What per-person cost, in USD, would you like to assume for M3?	Can input any value; recommended range is written below	<i>Benchmarking spreadsheet</i>

Output: Annual estimated long-term operating costs

Toggle by maturity level
or country

	Maturity level 1	Maturity level 2	Maturity level 3
# people	xx	xx	xx



\$/ person/ year	xx	xxx	xx
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Annual cost (\$M USD)	\$xx	\$xx	\$xx
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Total annual cost to sustainably deliver digitally-enabled health services for all:
\$xx billion per year

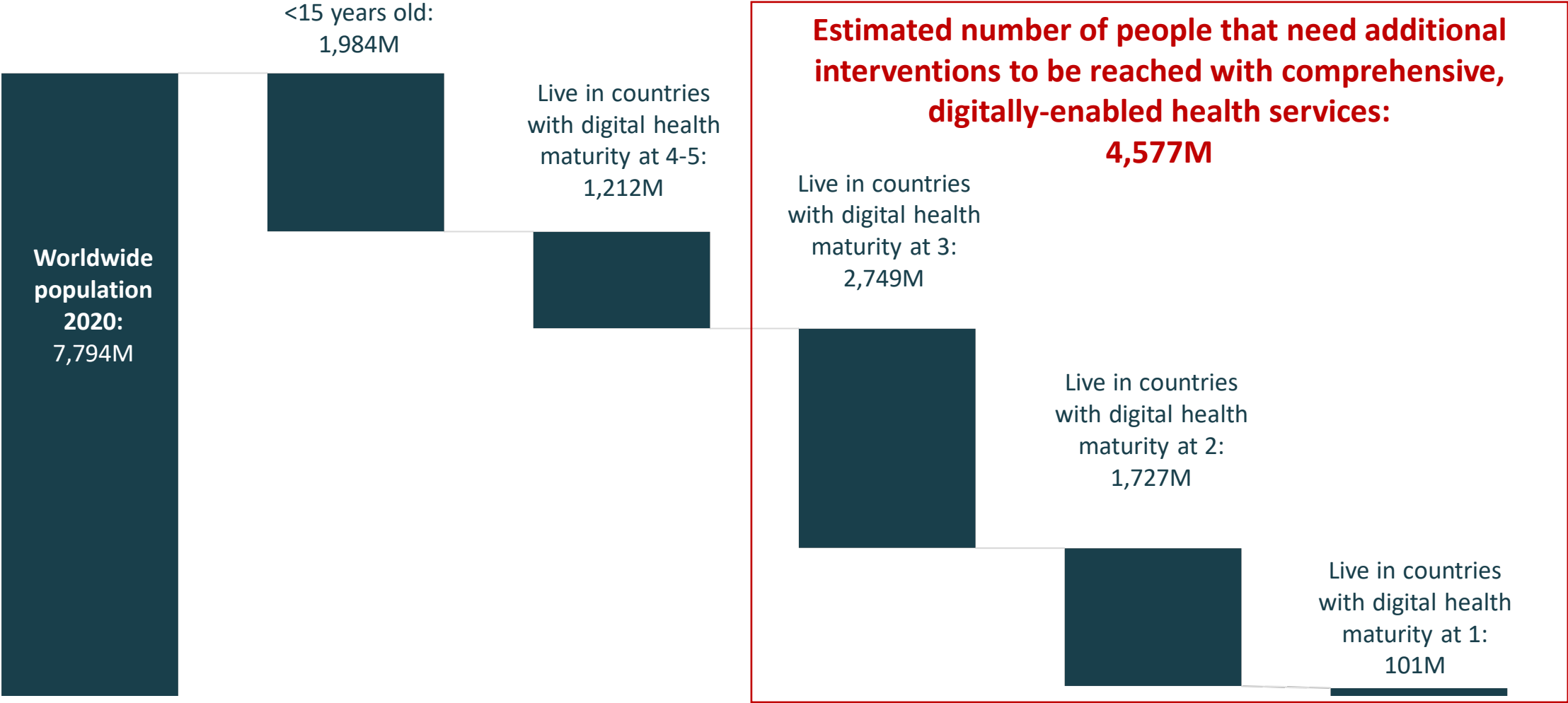
Post your model output on social media/etc. and share reflections on the estimate

Open commenting on the 'benchmark spreadsheet'

Promotion of GDHI

General feedback

Estimate of how many people need to be reached



Source: UNPD World Population Prospects 2019; Global Digital Health Index; Digital Square market maturity analysis
Digital Square | connecting the world for better health

Estimate of annual operating cost per person

An Maturity level 2 East African country spends \$40K per district per year on its immunization registry

A Maturity level 2 Asian country spends ~\$5/person/year for frontline health worker continuum of care services

A Maturity level 4 South African employer spends \$5/person/year on a digital health insurance platform

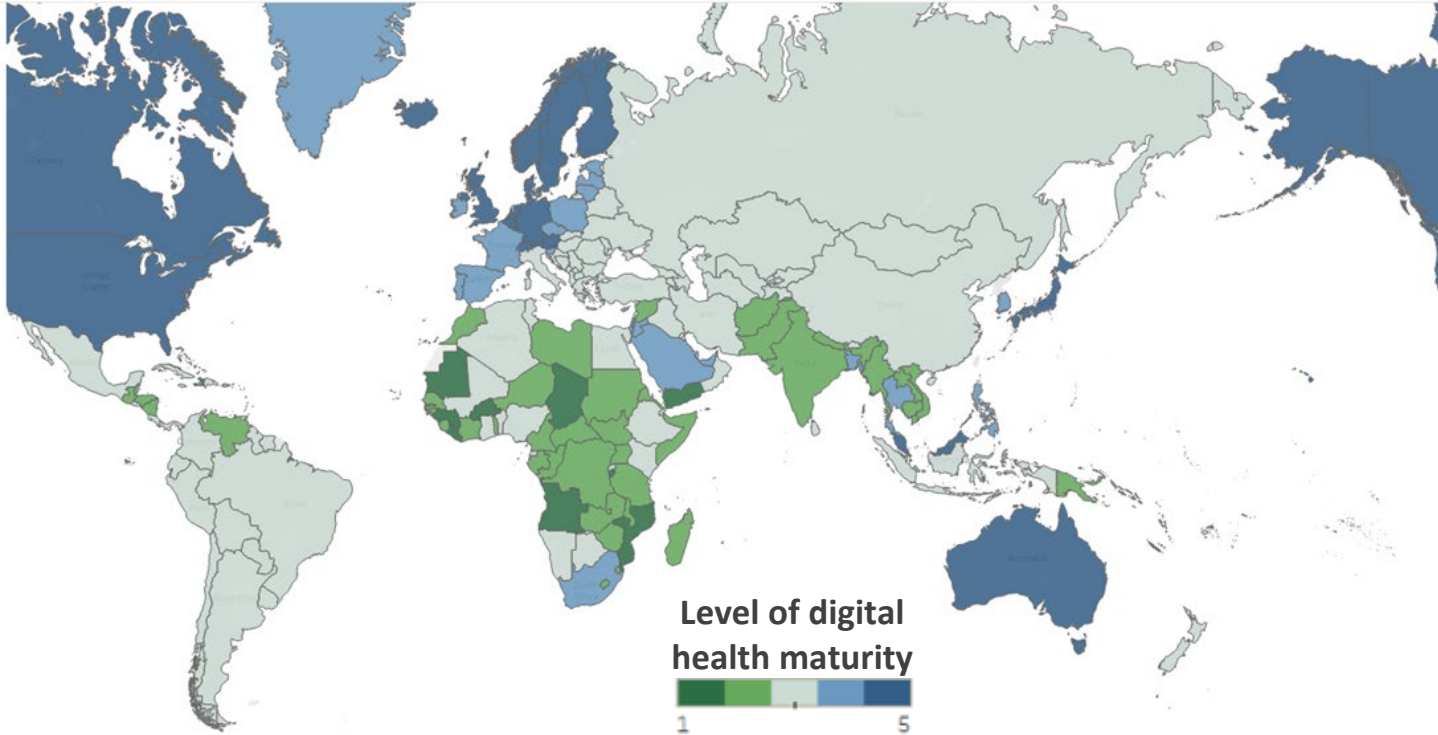
A Maturity level 2 African country has budgeted ~\$0.36 per person (all ages) per year for holistic digital health service provision

Other costing benchmarks forthcoming in Q1 2021

Maturity level 3:
\$0.25-\$0.50 per >14 person per year

Maturity level 2:
\$0.50-\$1 per >14 person per year

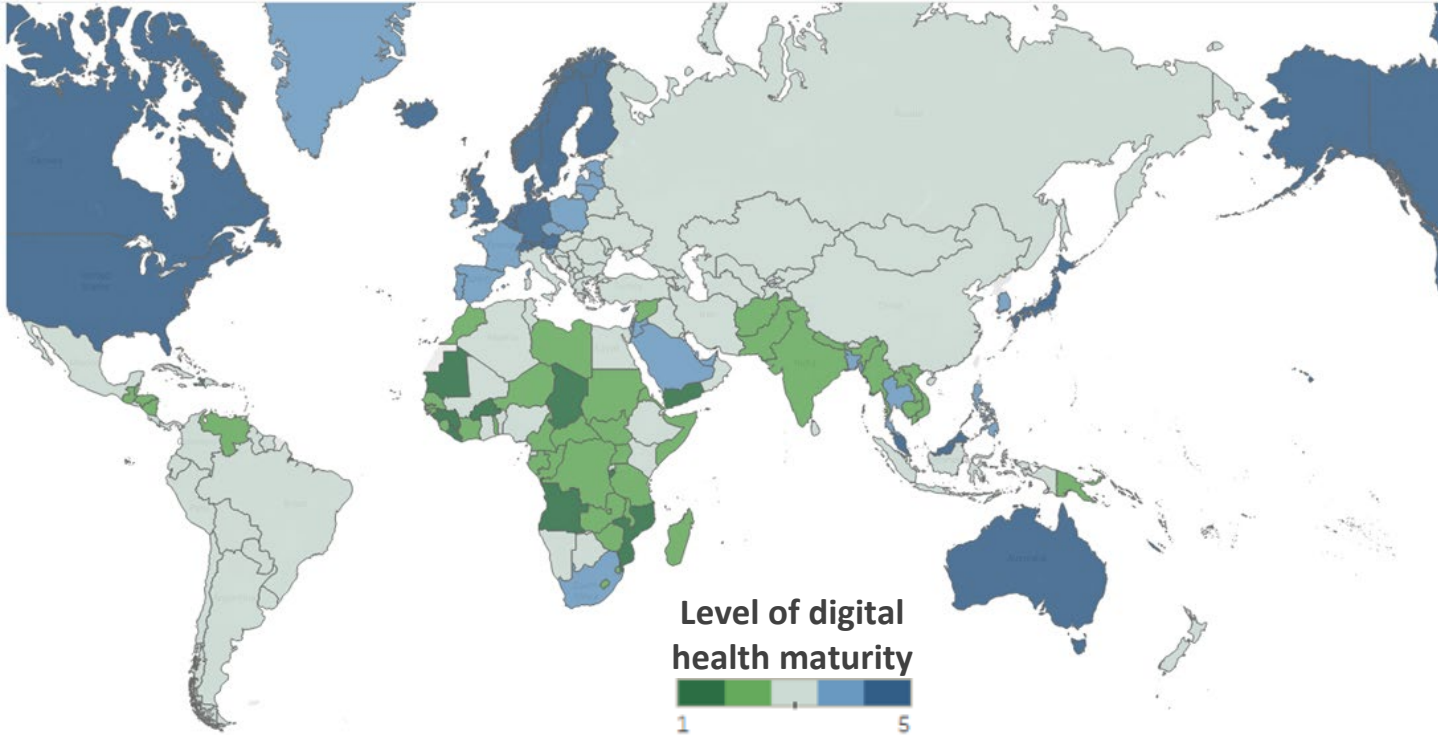
Maturity level 1:
\$1-\$5 per >14 person per year



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	Maturity level 1	Maturity level 2	Maturity level 3
# people >15, (millions)	101	1,727	2,749

1.0 CLIENTS			2.0 HEALTHCARE PROVIDERS		3.0 HEALTH SYSTEM MANAGERS		4.0 DATA SERVICES				
1.1	Targeted Client Communication (1)	3	2.1	Client identification and registration	10	3.1	Human Resource Management	4	4.1	Data Collection, Management and Use (9)	16
1.2	Untargeted Client Communication	1	2.2	Client Health Records	12	3.2	Supply Chain Management	7	4.2	Data Coding (1)	4
1.3	Client to Client Communication	0	2.3	Healthcare provider decision support	11	3.3	Public Health Event Notification	2	4.3	Location Mapping (6)	8
1.4	Personal Health Tracking	1	2.4	Telemedicine	4	3.4	Civil Registration and Vital Statistics	1	4.4	Data Exchange and Interoperability (4)	13
1.5	Citizen-based Reporting	4	2.5	Healthcare provider communication	7	3.5	Health Financing	1	Legend <ul style="list-style-type: none"> • Shaded (#): Global goods supported by Digital Square (approved by Digital Square Board) • White: Not currently supported by Digital Square 		
1.6	On-demand information services to clients	3	2.6	Referral coordination	10	3.6	Equipment and Asset Management	6			
1.7	Client financial transactions	2	2.7	Health worker activity planning & scheduling	7	3.7	Facility Management	6			
			2.8	Healthcare provider training	4						
			2.9	Prescription and medication management	3						
			2.10	Laboratory and Imaging Management Diagnostics	5						



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\$/ person/ year	\$1-5	\$0.5-1	\$0.25-0.5

1.0 CLIENTS

1.1	Targeted Client Communication (1)	3
1.2	Untargeted Client Communication	1
1.3	Client to Client Communication	0
1.4	Personal Health Tracking	1
1.5	Citizen-based Reporting	4
1.6	On-demand information services to clients	3
1.7	Client financial transactions	2

2.0 HEALTHCARE PROVIDERS

2.1	Client identification and registration	10
2.2	Client Health Records	12
2.3	Healthcare provider decision support	11
2.4	Telemedicine	4
2.5	Healthcare provider communication	7
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2.7	Health worker activity planning & scheduling	7
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3.0 HEALTH SYSTEM MANAGERS

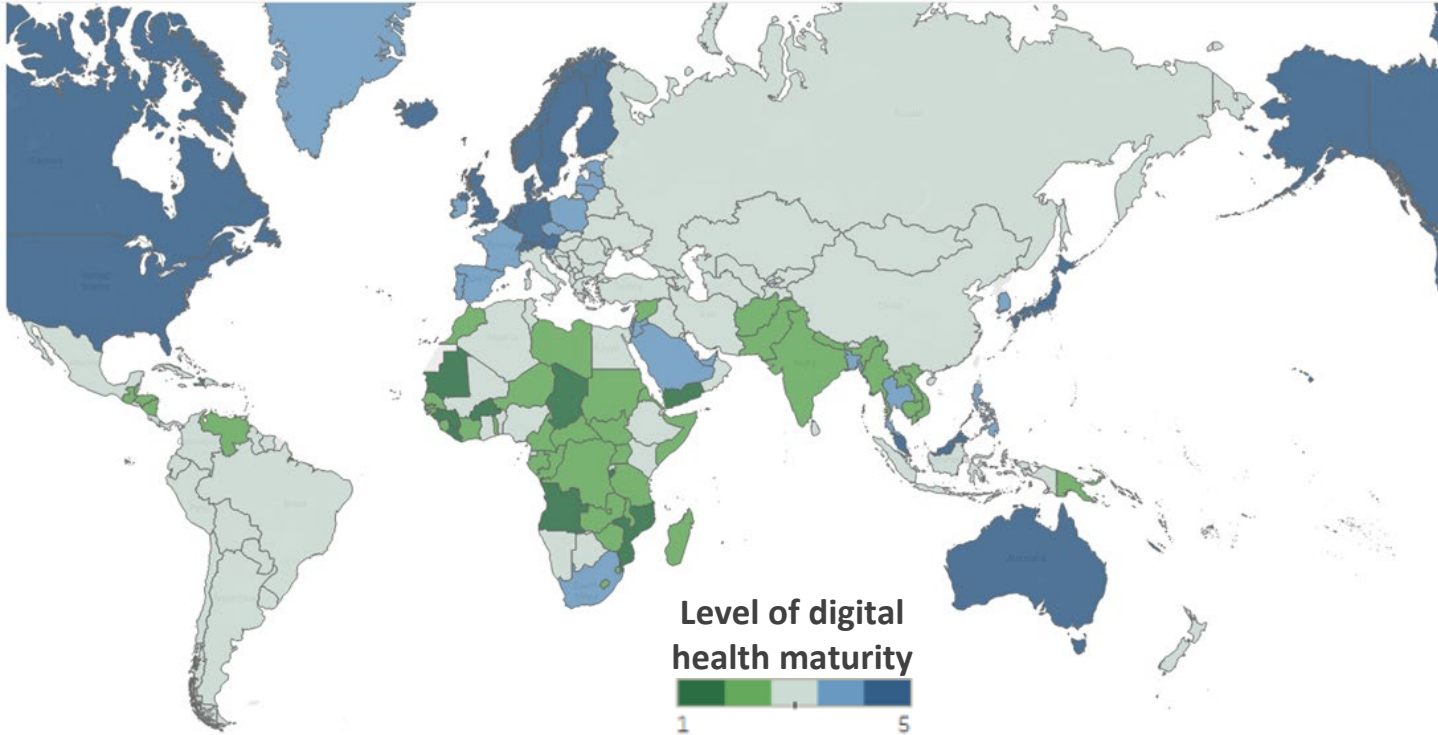
3.1	Human Resource Management	4
3.2	Supply Chain Management	7
3.3	Public Health Event Notification	2
3.4	Civil Registration and Vital Statistics	1
3.5	Health Financing	1
3.6	Equipment and Asset Management	6
3.7	Facility Management	6

4.0 DATA SERVICES

4.1	Data Collection, Management and Use (9)	16
4.2	Data Coding (1)	4
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Legend

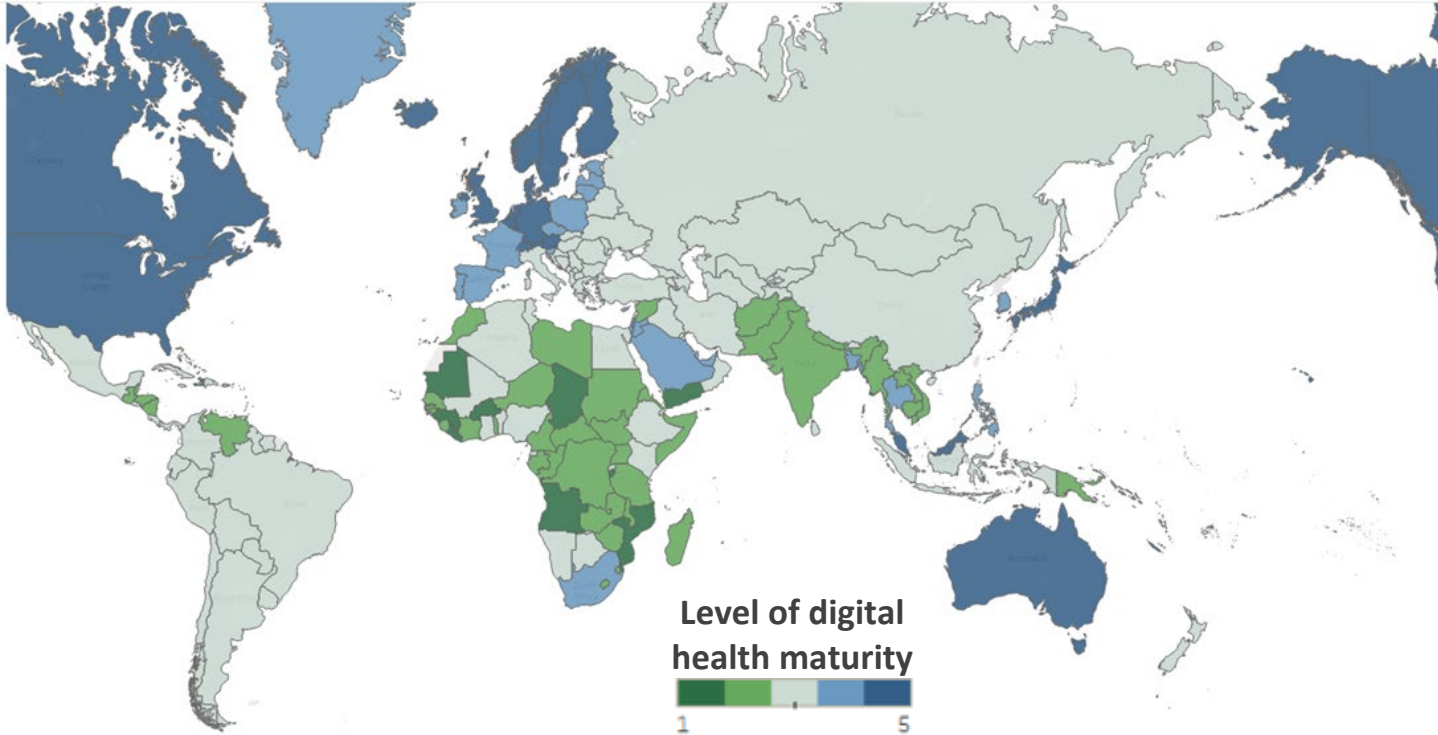
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Annual cost (\$M USD)	\$101-\$505	\$864-\$1,727	\$687-1,374

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Total annual cost to sustainably deliver digitally-enabled health services for all: **\$1.7-\$4.0 billion per year**

Conclusions

- Current estimates to provide digitally-enabled care for all, even when ranged, exceed the bounds of what's affordable at global scale for philanthropic funders
- Long-term financing will require a mix of philanthropic, out-of-pocket (consumer) and domestic government funding
- A healthy digital health market will require innovative financing mechanisms to efficiently allocate this blended financing model
- ...it will also require a procurement vehicle that can shape the market to incent and drive down per-person pricing, potentially by aggregating demand

“Governments around the world are embracing this new age of digital health transformation. Expectations are high as more governments look towards these new tools and the connections they create.”

Dr. Mpoki Ulisubisya, Permanent Secretary
Tanzania Ministry of Health, Community Development, Gender, Elderly and Children

OpenHIE Community Meeting, July 2018

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Digital Square is a PATH-led initiative funded and designed by the United States Agency for International Development, the Bill & Melinda Gates Foundation, and a consortium of other donors.

This presentation was made possible by the generous support of the American people through the United States Agency for International Development. The contents are the responsibility of PATH and do not necessarily reflect the views of USAID or the United States Government.