Swiss TPH

The Need for a Vision: Evidence and Feasibility Considerations

Clinical Decision Support Systems
Features, Future and Fostering Collaboration

Xavier Bosch-Capblanch

8th February 2023

Contents

1 History of data and health: from the Roman Empire till today

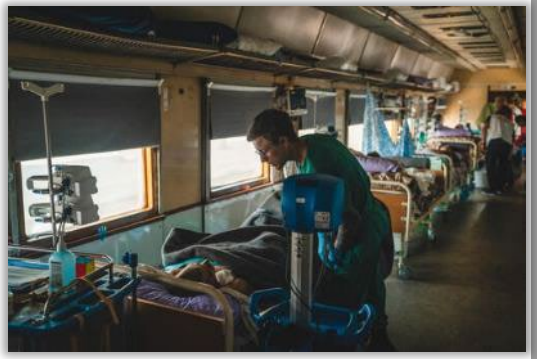
2 CDSS: Coupling Decisions and Data for Several Situations

3 A vision for CDSS

Vision, Mission and Strategic Goals

Our Vision

Together, we can make the world a healthier place.



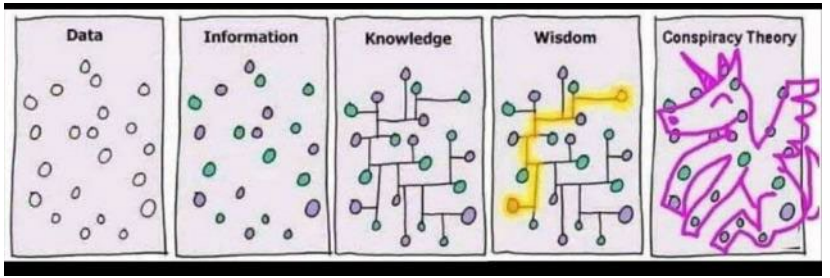
Our Mission

Swiss TPH is dedicated to improving the health and well-being of people – locally, nationally and internationally – through excellence in research, education and services.

Swiss TPH

1 History of data and health

1·1 Data collection (since Palaeolithic)



1·1 Data quality (around 2000)

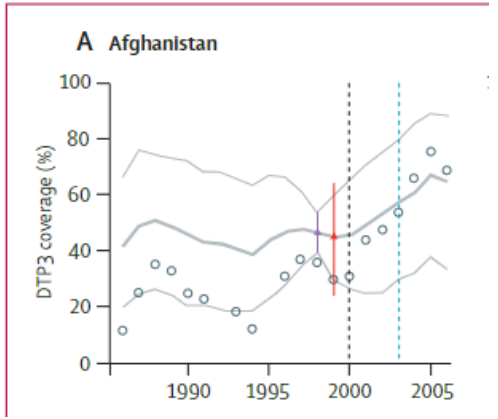
Tracking progress towards universal childhood immunisation and the impact of global initiatives: a systematic analysis of three-dose diphtheria, tetanus, and pertussis immunisation coverage

Stephen S Lim, David B Stein, Alexandra Charrow, Christopher J L Murray

Summary

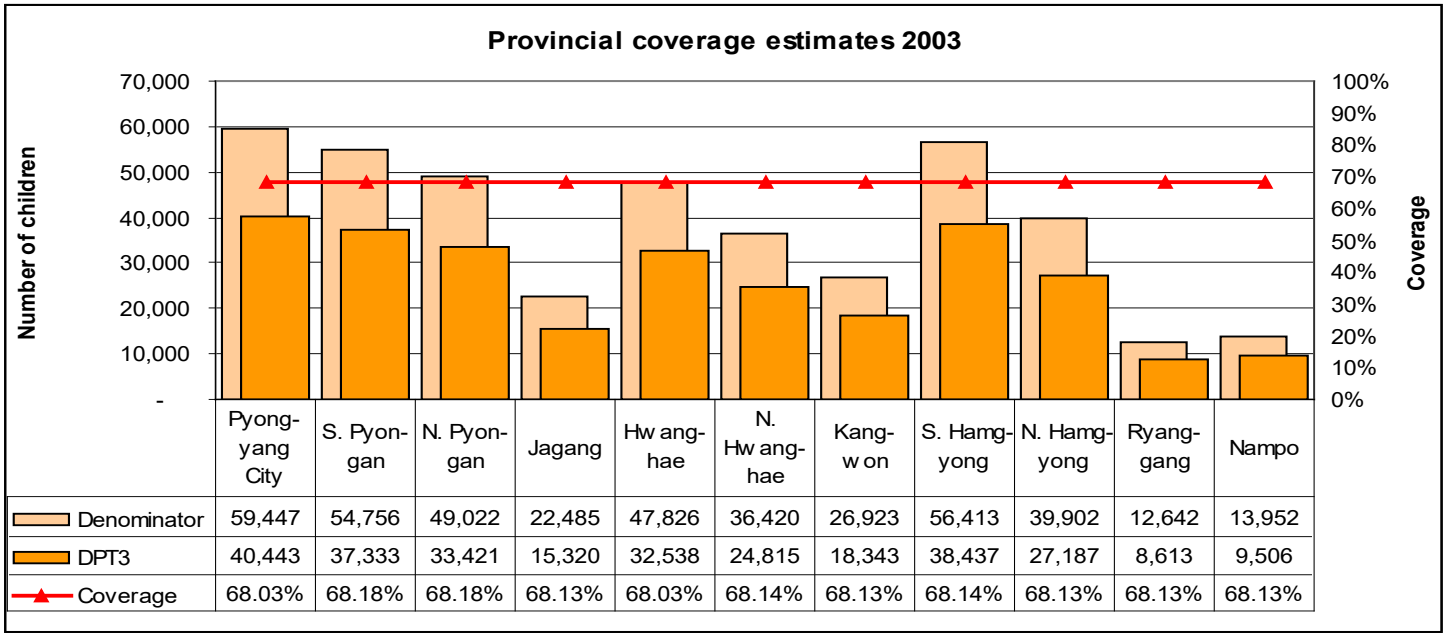
Background Substantial resources have been invested in increasing childhood immunisation coverage through global

Lancet 2008; 372: 2031–46



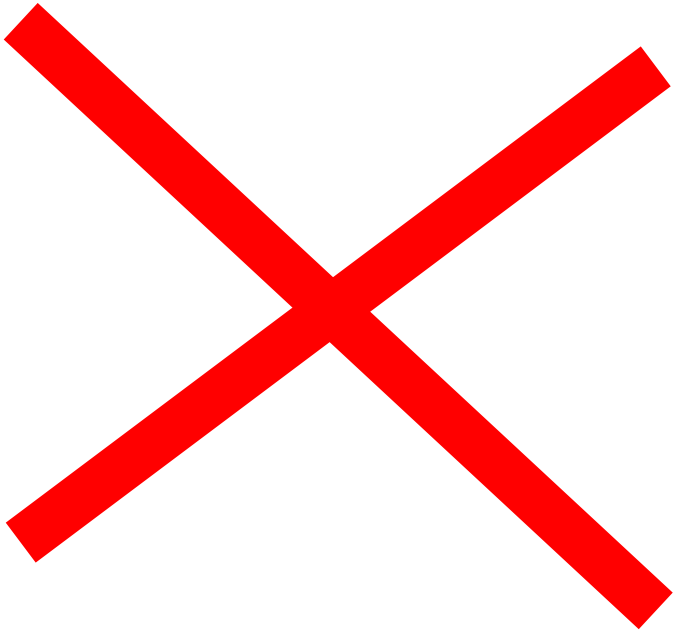
reported estimates of 13·9 million. On the basis of the number of additional children immunised from surveys at a rate of US$20 each, GAVI ISS payments are estimated at $150 million (115 million to 184 million) compared with actual disbursements of $290 million.

1·2 Data quality (continuation)

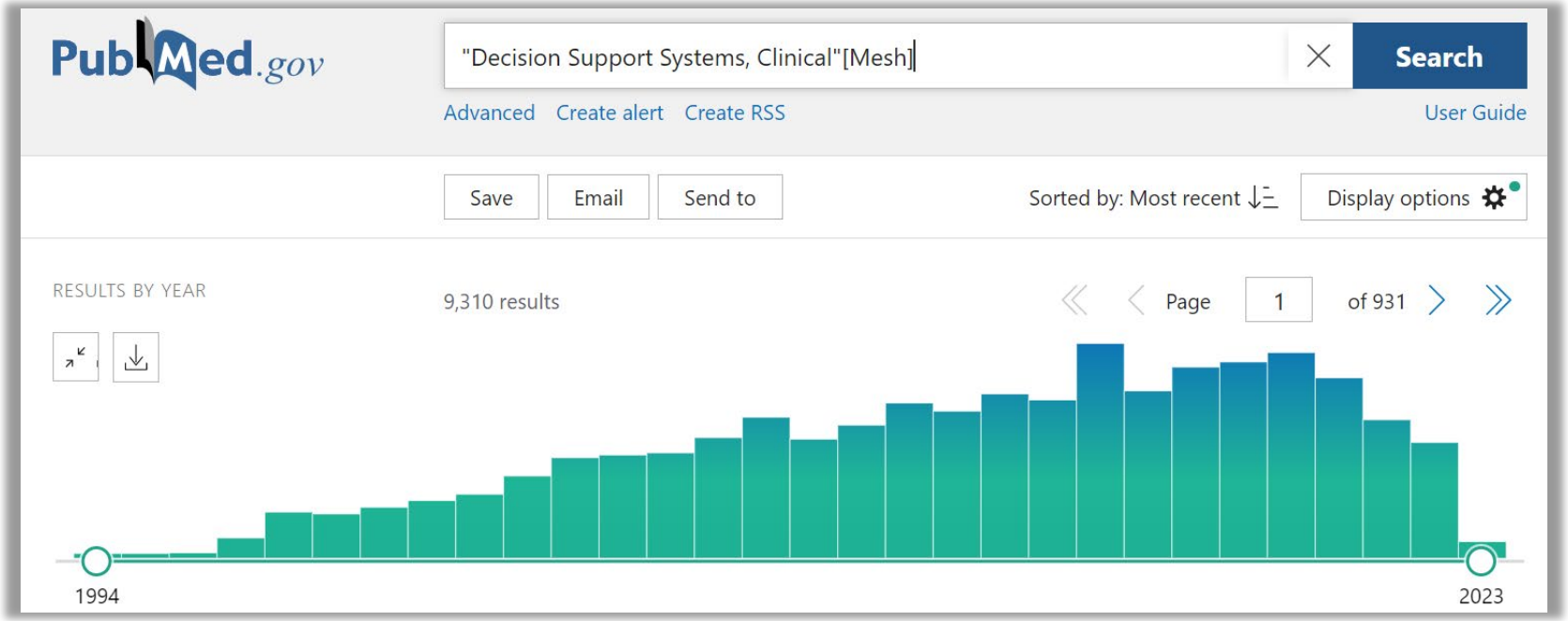


	Pyong-yang City	S. Pyon-gan	N. Pyon-gan	Jagang	Hwang-hae	N. Hwang-hae	Kang-won	S. Hamg-yong	N. Hamg-yong	Ryang-gang	Nampo
Denominator	59,447	54,756	49,022	22,485	47,826	36,420	26,923	56,413	39,902	12,642	13,952
DPT3	40,443	37,333	33,421	15,320	32,538	24,815	18,343	38,437	27,187	8,613	9,506
Coverage	68.03%	68.18%	68.18%	68.13%	68.03%	68.14%	68.13%	68.14%	68.13%	68.13%	68.13%

1·3 Data use (2010)



1·4 Data for decision making – CDSS (finally!) (1980s till now)



Swiss TPH

2 CDSS

· Decisions · Clinical · System · Support ·

Bosch-Capblanch *et al. Health Res Policy Sys* (2021) 19:112
https://doi.org/10.1186/s12961-021-00768-0

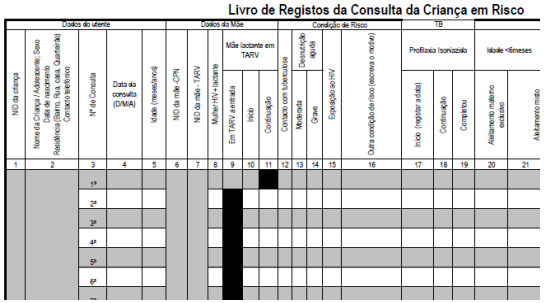
Health Research Policy and Systems

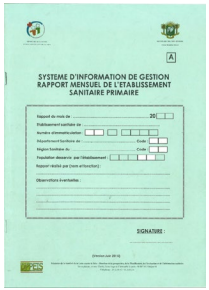
STUDY PROTOCOL **Open Access**

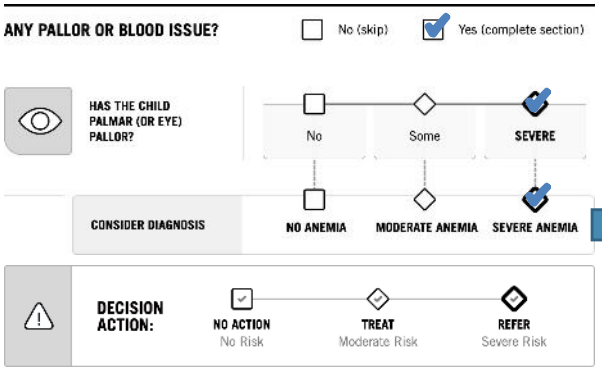
Researching, co-creating and testing innovations in paper-based health information systems (PHISICC) to support health workers' decision-making: protocol of a multi-country, transdisciplinary, mixed-methods research programme in three sub-Saharan countries

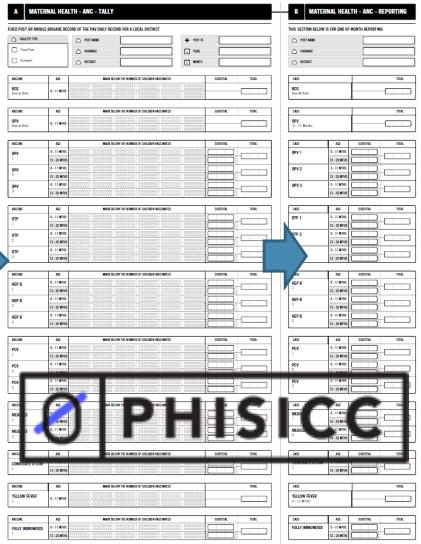
Xavier Bosch-Capblanch[1,2*], David O'Donnell[3], L. Kendall Krause[4], Christian Auer[1,2], Angela Oyo-Ita[5], Mamadou Samba[6,7], Graça Matsinhe[8], Abdullahi Bulama Garba[9], Damaris Rodríguez[10], Meike Zuske[1,2], Anthonia Ngozi Njepuome[11], Sofia Micael Mandjate Lee[12], Amanda Ross[1,2], Suzanne Gajewski[1,2], Artur Manuel Muloliwa[13], Richard B. Yapi[14,15] and David W. Brown[16]

· Decisions · Clinical · System · Support ·









· Decisions · Clinical · System (1) · Support ·

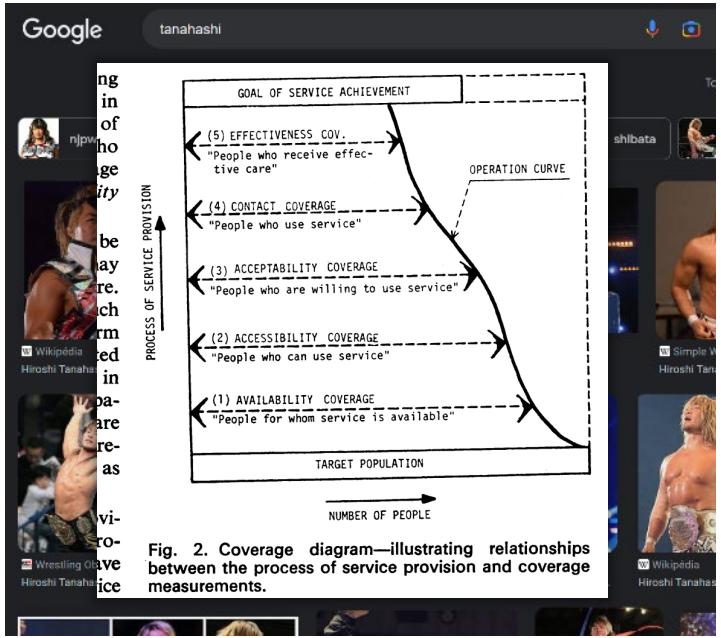
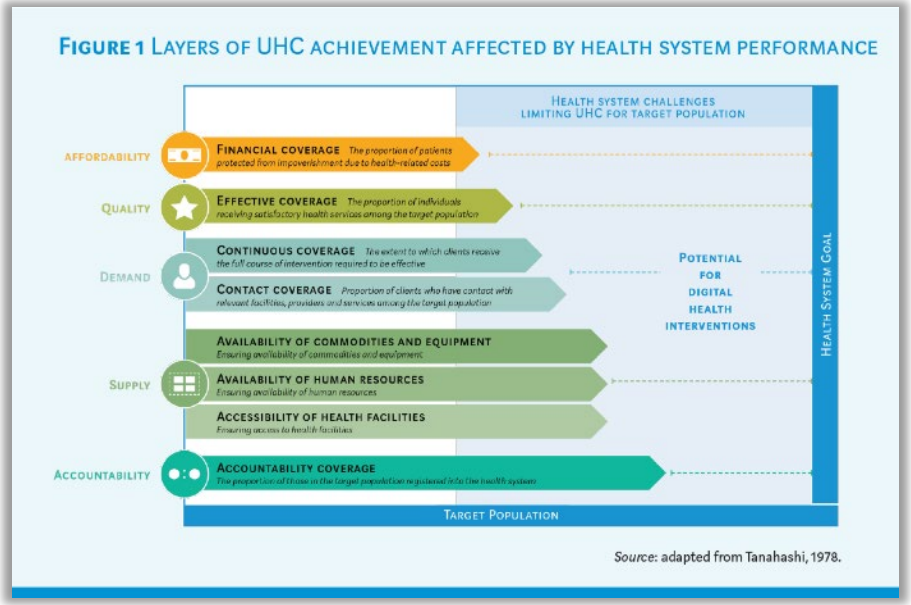
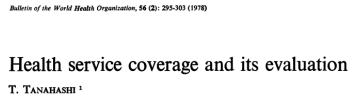


Fig. 2. Coverage diagram—illustrating relationships between the process of service provision and coverage measurements.



Source: adapted from Tanahashi, 1978.



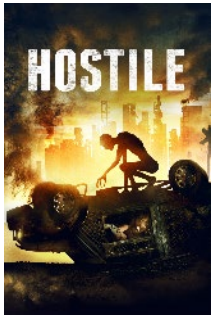
Bulletin of the World Health Organization, 56 (2): 295-303 (1978)

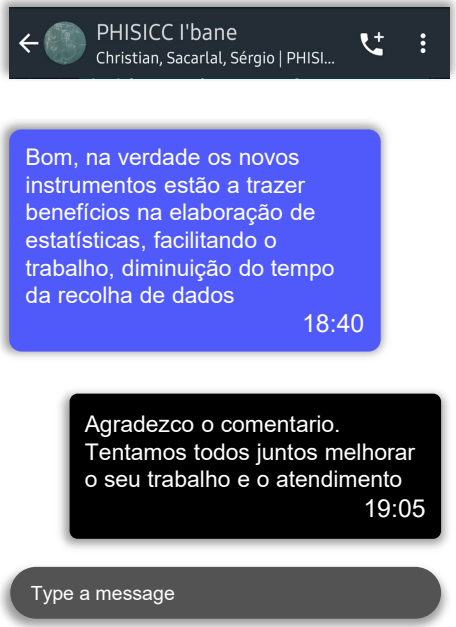
Health service coverage and its evaluation

T. TANAHASHI [1]

· Decisions · Clinical · System (2) · Support ·

· Decisions · Clinical · System · Support ·





August 2021

HIS Mapping: An Inventory of Digital Tools in Use by the Ministry of Health and Family Welfare in Bangladesh

Md Humayun Kabir, D4I
Mohammad Kibria, USAID STAR Fellowship Project

- 10 pages
- 114 tools
- 29 operational plans

Time to reality check the promises of machine learning-powered precision medicine

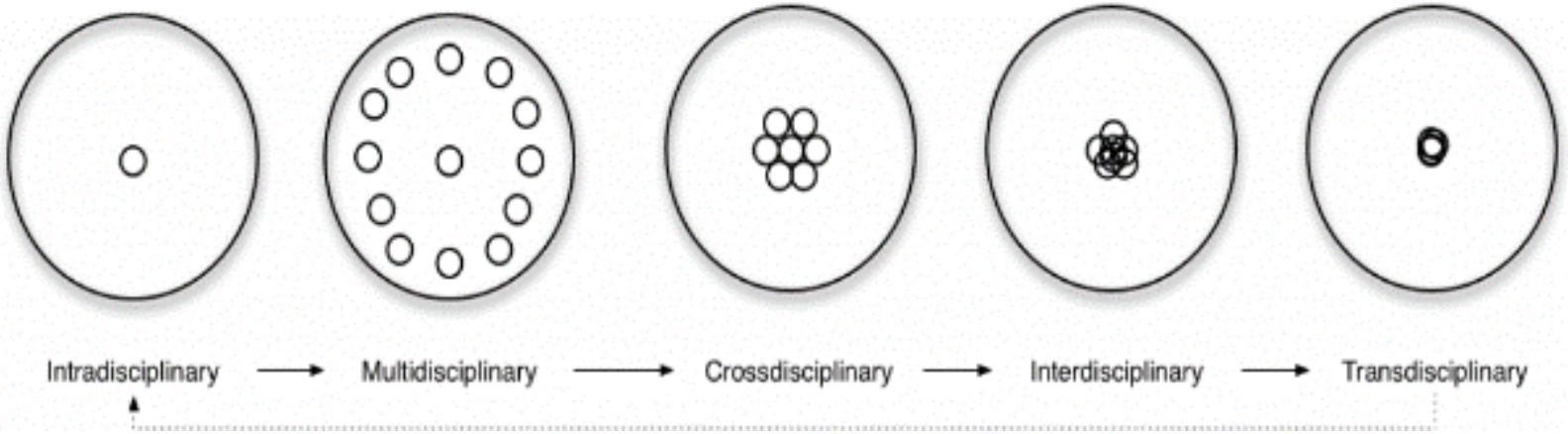
Jack Wilkinson, Kellyn F Arnold, Eleanor J Murray, Maarten van Smeden, Kareem Carr, Rachel Sippy, Marc de Kamps, Andrew Beam, Stefan Konigorski, Christoph Lippert, Mark S Gilthorpe, Peter W G Tennant

Machine learning methods, combined with large electronic health databases, could enable a personalised approach to *Lancet Digital Health* 2020;

Swiss TPH

3 A vision to make it fair

3·1 Transdisciplinary to make it relevant



ARJ. Disciplinarities: intra, cross, multi, inter, trans. 2012 (https://www.arj.no/2012/03/12/disciplinarities-2/)

3·2 Evidence-based to make it into policy (1)

1.2.12 Number of women who had emergency referral due to suspected sepsis

Martinez 2018 (10)	4	425	5	374	100.0%	0.70 [0.19 , 2.60]
Subtotal (95% CI)		**425**		**374**	**100.0%**	**0.70 [0.19 , 2.60]**
Total events:	4		5			

Heterogeneity: Not applicable

Test for overall effect: Z = 0.53 (P = 0.60)

1.2.13 Number of women who had emergency referral due to respiratory compromise

Martinez 2018 (11)	5	425	2	374	100.0%	2.20 [0.43 , 11.27]
Subtotal (95% CI)		**425**		**374**	**100.0%**	**2.20 [0.43 , 11.27]**
Total events:	5		2			

Heterogeneity: Not applicable

Test for overall effect: Z = 0.95 (P = 0.34)

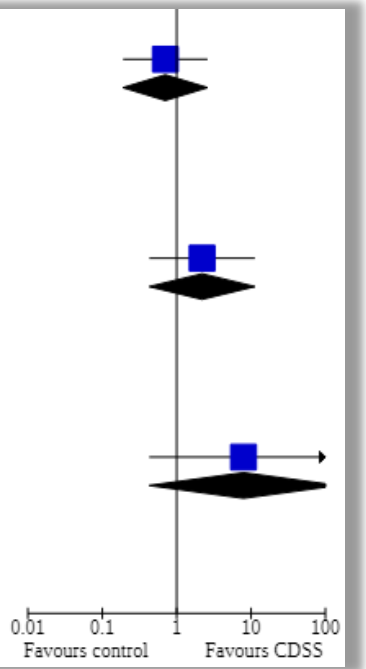
1.2.14 Number of women who had emergency referral due to a preterm newborn

Martinez 2018 (12)	4	425	0	374	100.0%	7.92 [0.43 , 146.67]
Subtotal (95% CI)		**425**		**374**	**100.0%**	**7.92 [0.43 , 146.67]**
Total events:	4		0			

Heterogeneity: Not applicable

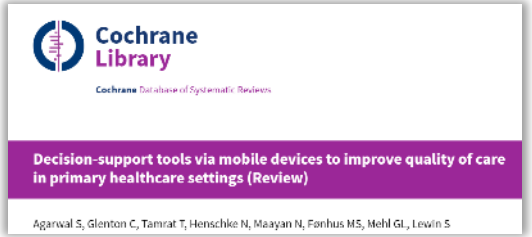
Test for overall effect: Z = 1.39 (P = 0.16)

Footnotes



Agarwal S, Glenton C, Tamrat T, Henschke N, Maayan N, Fønhus MS, Mehl GL, Lewin S. Decision-support tools via mobile devices to improve quality of care in primary healthcare settings. Cochrane Database Syst Rev. 2021 Jul 27;7(7):CD012944. doi: 10.1002/14651858.CD012944.pub2. PMID: 34314020; PMCID: PMC8406991.

3·2 Evidence-based to make it into policy (2)



What were the main results of the review?

We found eight relevant studies. Three studies were carried out in the USA and five studies in India, China, Guatemala, Ghana, and Kenya. These studies showed that when primary healthcare workers use decision-support tools on mobile phones:

– we do not know if they are better at following recommended clinical practice, because the quality of this evidence was very low;

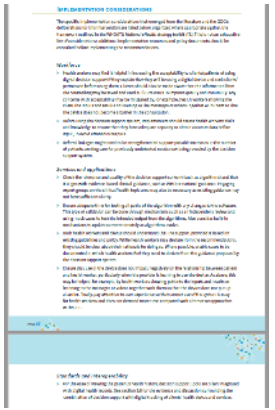
– there was no clear pattern of a positive or negative effect on patients' or clients' behaviour and on their health;

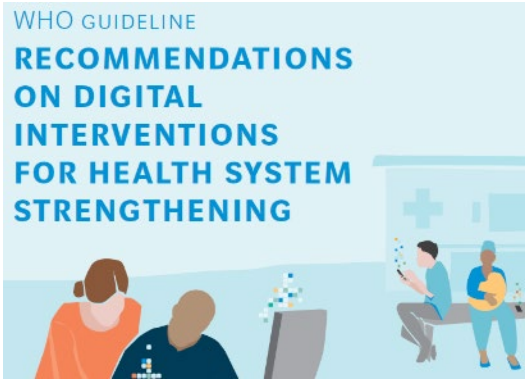
– this may slightly improve patients' satisfaction with medical information;

– we do not know if this approach led primary healthcare workers to manage people's health issues more quickly because we found no studies that measured this. We also found no studies that explored the effect on healthcare worker satisfaction, resource use, or whether this approach had any unintended consequences (e.g. harms).

Agarwal S, Glenton C, Tamrat T, Henschke N, Maayan N, Fønhus MS, Mehl GL, Lewin S. Decision-support tools via mobile devices to improve quality of care in primary healthcare settings. Cochrane Database Syst Rev. 2021 Jul 27;7(7):CD012944. doi: 10.1002/14651858.CD012944.pub2. PMID: 34314020; PMCID: PMC8406991.

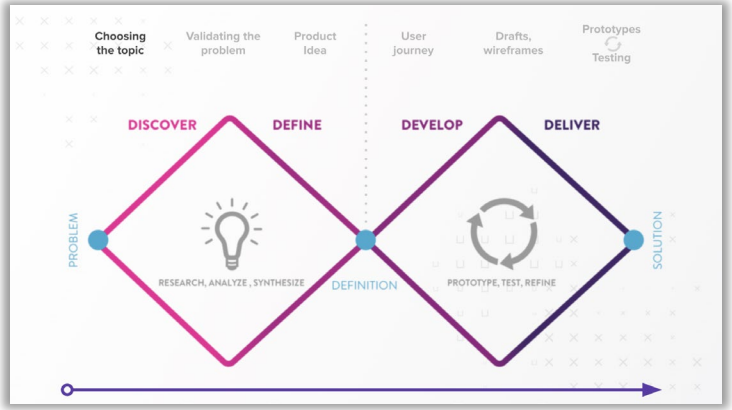
3·2 Evidence-based to make it into policy (3)

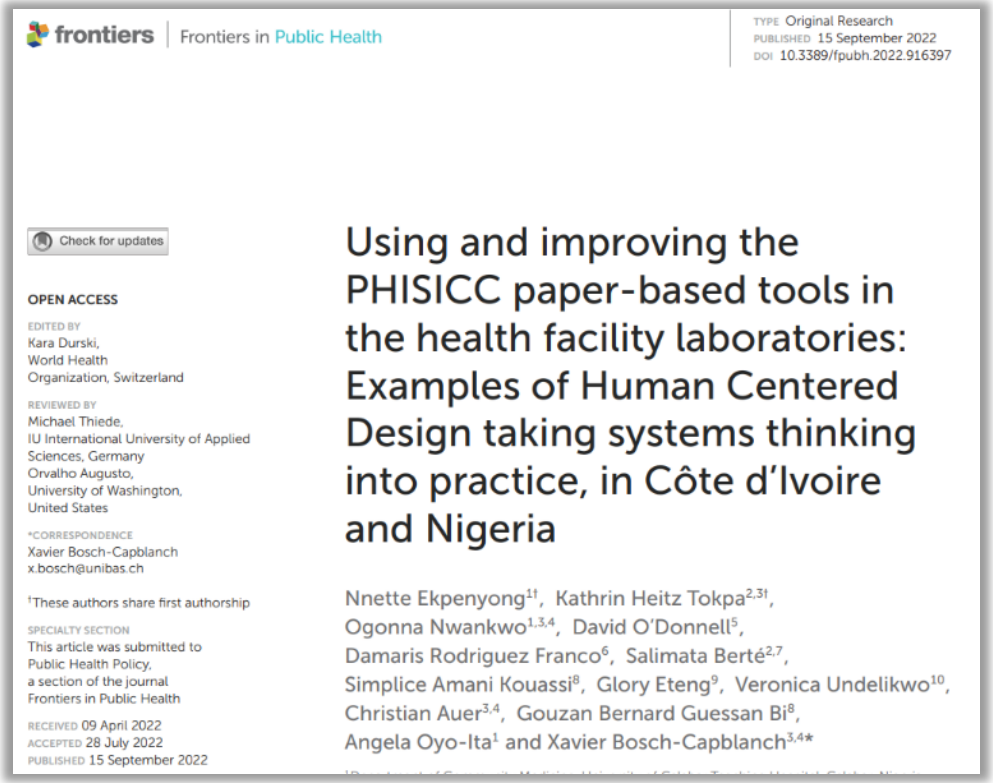




Amid the heightened interest, digital health has also been characterized by implementations rolled out in the absence of a careful examination of the evidence base on benefits and harms. The enthusiasm for digital health has also driven a proliferation of short-lived implementations and an overwhelming diversity of digital tools, with a limited understanding of their impact on health systems and people's well-being. This concern was highlighted most notably in the consensus statement of the WHO Bellagio eHealth Evaluation Group, which opened by stating: "To improve health and reduce health inequalities, rigorous evaluation of eHealth is necessary to generate evidence and promote the appropriate integration and use of technologies." While recognizing the innovative role that digital technologies can play in strengthening the health system, there is an equally important need to evaluate their contributing effects and ensure that such investments do not inappropriately divert resources from alternative, non-digital approaches.

3·3 Human Centred Designed to make it work





frontiers | Frontiers in Public Health

TYPE Original Research
PUBLISHED 15 September 2022
DOI 10.3389/fpubh.2022.916397

Check for updates

OPEN ACCESS

EDITED BY
Kara Durski,
World Health
Organization, Switzerland

REVIEWED BY
Michael Thiede,
IU International University of Applied
Sciences, Germany
Orvalho Augusto,
University of Washington,
United States

*CORRESPONDENCE
Xavier Bosch-Capblanch
x.bosch@unibas.ch

†These authors share first authorship

SPECIALTY SECTION
This article was submitted to
Public Health Policy,
a section of the journal
Frontiers in Public Health

RECEIVED 09 April 2022
ACCEPTED 28 July 2022
PUBLISHED 15 September 2022

Using and improving the PHISICC paper-based tools in the health facility laboratories: Examples of Human Centered Design taking systems thinking into practice, in Côte d'Ivoire and Nigeria

Nnette Ekpenyong[1†], Kathrin Heitz Tokpa[2,3†], Ogonna Nwankwo[1,3,4], David O'Donnell[5], Damaris Rodriguez Franco[6], Salimata Berté[2,7], Simplice Amani Kouassi[8], Glory Eteng[9], Veronica Undelikwo[10], Christian Auer[3,4], Gouzan Bernard Guessan Bi[8], Angela Oyo-Ita[1] and Xavier Bosch-Capblanch[3,4]*

Vision, Mission and Strategic Goals

Our Vision

Together, we can make the world a healthier place.

Our Mission

Swiss TPH is dedicated to improving the health and well-being of people – locally, nationally and internationally – through excellence in research, education and services.

Figueroa CA, Murayama H, Amorim PC, White A, Quiterio A, Luo T, Aguilera A, Smith ADR, Lyles CR, Robinson V and von Vacano C (2022) Applying the Digital Health Social Justice Guide. Front. Digit. Health 4:807886. doi: 10.3389/fdgth.2022.807886

Swiss TPH

Thank you for your attention