

**AeHIN Digital Health Conference and 5th General Meeting**

# MomConnect - Digital Health Architecture in Action

**Christopher Seebregts**  
 Founder and Chief Executive Officer, Jembi  
 Hon Assoc Prof, Comp Sci, University of KwaZulu-Natal  
 Hon Res Assoc., Public Health, University of Cape Town  
[chris@jembi.org](mailto:chris@jembi.org)

**Peter Barron**  
 Technical Adviser  
 South African National Dept of Health

**Vincent Shaw**  
 Executive Director, HISP-SA




## Objective of Presentation

Describe the use of digital health architectural principles and to implement MomConnect, a highly successful national patient-level health information system in South Africa.

Seebregts CJ, Benjamin P, Tanna, G and Barron P. MomConnect: an exemplar national mobile maternal health implementation in South Africa (2016). *South African Health Review*, 2016, 125-136.




## BRIEF OVERVIEW OF MOMCONNECT PROGRAMME



## Beginnings

- Initiative of the South African National Department of Health to reduce MMR (currently 132 and aiming for 38)
- Pregnant women in public sector use mobile phones to register pregnancies
- Mother sent stage-based messages to support her and her baby
- Women provide feedback to the health system so that it responds to the needs of pregnant women



<http://www.health.gov.za/index.php/mom-connect>



## How does it work?




- Nurse confirms pregnancy at clinic.
- Nurse helps user register on their phone via USSD.
- User answers questions about pregnancy.
- User is registered.
- Pregnancy is registered in the National Database.
- User receives weekly SMS messages to inform them of their pregnancy and baby health up to their child is 1 year old.

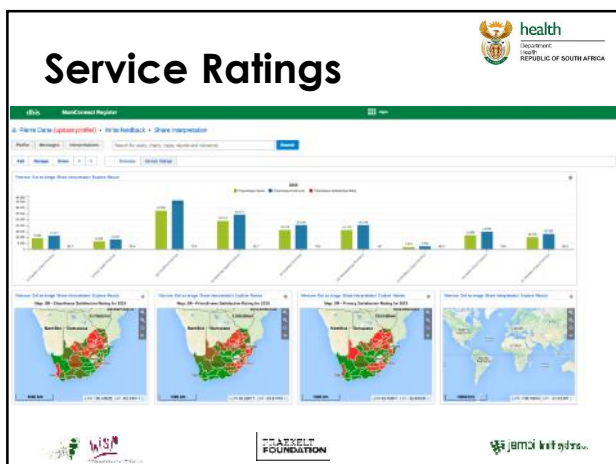



## Current Status

- More than 1 million unique pregnancies registered from all locations in SA in the first two years - 50% and 60% of all pregnancies expected in the public sector over the period
- Service Ratings monitored in real time
- Interoperability extended to other mobile and eHealth service providers
- Extended to NurseConnect, supporting health workers (South Africa)
- Architecture being implemented as FamilyConnect by UNICEF in Uganda

<http://www.health.gov.za/index.php/mom-connect>





## POLICY ENVIRONMENT

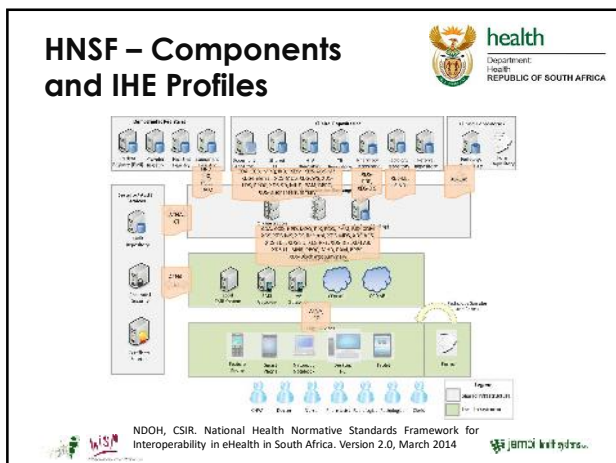
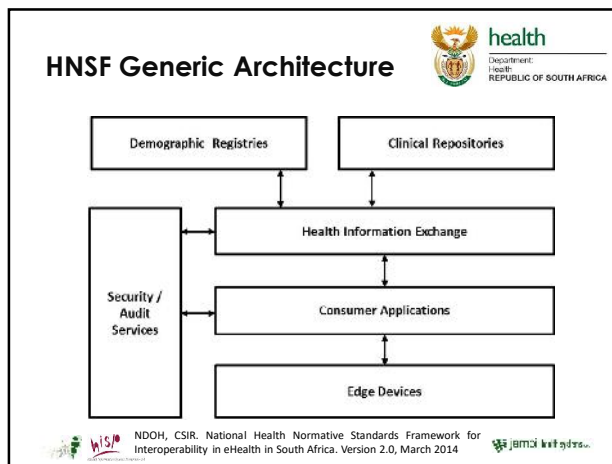
### Legal Framework for Digital Health

- Health Normative Standards Framework for Interoperability in eHealth in South Africa (HNSF)
- Commissioned by the South African National Department of Health (NDoH)
- Developed by the national science council (CSIR Meraka Institute) in collaboration with the (Nelson Mandela Metropolitan University (NMMU))
- Extends our National Health Act

STATUTORY INSTRUMENTS 2014 (R. 014)  
 GOVERNMENT NOTICE  
 No. 214 DEPARTMENT OF HEALTH 20 April 2014  
 NATIONAL HEALTH ACT, 2003 (ACT NO. 61 OF 2003)

NOTICE IN TERMS OF THE NATIONAL HEALTH ACT NO 61 OF 2003: NATIONAL HEALTH NORMATIVE STANDARDS FRAMEWORK FOR INTEROPERABILITY IN eHEALTH

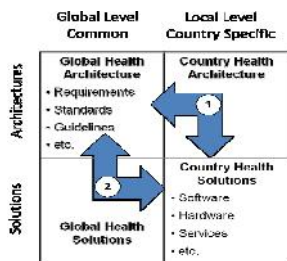
NDOH, CSIR, National Health Normative Standards Framework for Interoperability in eHealth in South Africa, Version 2.0, March 2014;  
<http://www.gov.za/documents/national-health-act-national-health-normative-standards-framework-interoperability-ehealth>



## MOMCONNECT TECHNICAL IMPLEMENTATION

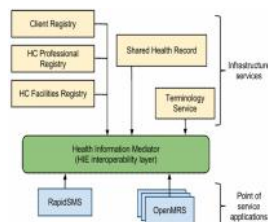
# Architecture and Solutions

slide courtesy of David Lubinski, PATH / BMGF.



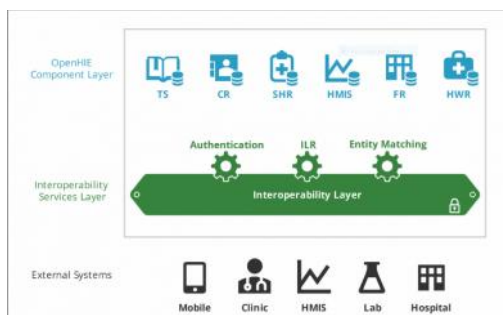
# Previous Work

- Original Rwanda Health Information Exchange based on a maternal use case
- Patterns reused in the design of MomConnect



Crichton R, Moodley D, Pillay A, Gakuba R, Seebregts CJ. An Interoperability Architecture for the Health Information Exchange in Rwanda. In: International Symposium on Foundations of Health Information Engineering and Systems, 2012

# Open HIE



<http://www.ohie.org>

# MomConnect Implementation

## HNSF Architecture

## MomConnect

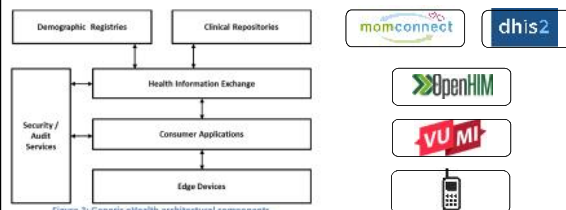


Figure 3: Generic eHealth architectural components

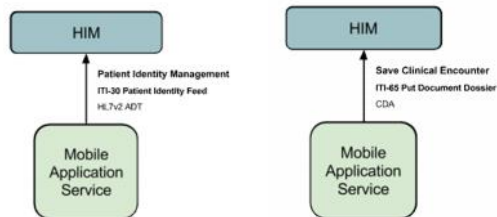
# Data Elements

Num	Element	Description
1	mha	Application ID
2	swi	Software ID
3	dmsisdn	Device Tel Number
4	cmsisdn	Client Telephone Number
5	id	Client ID
6	type	Message Type
7	lang	Language
8	encodate	Date
9	facocode	Facility Code
10	dob	Date of Birth
11	optoutreason	Opt Out Reason
12	edd	Estimated Due Date
13	data	Service Rating
14	repsdate	Response Date
15	class	Helpdesk Interaction
16	op	Helpdesk Operator ID

# Standards & Profiles for Mobile to Interoperability Layer Transactions

## Patient Administration


## Save Clinical encounter



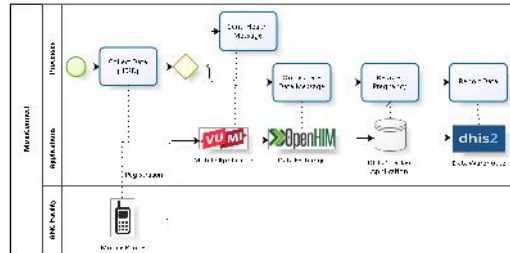

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## NEXT STEPS






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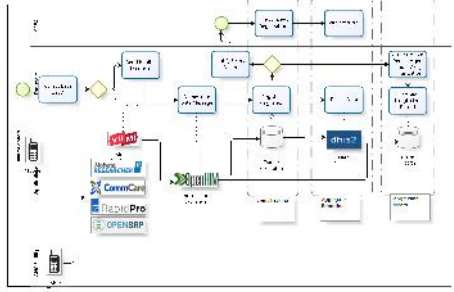
## Process Flow






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## Extending to CoC and CRVS



Edward Duffus  
 Digital Birth Reg Lead, PLAN International  
[Edward.Duffus@plan-international.org](mailto:Edward.Duffus@plan-international.org)


## OpenCRVS




A standards based, freely available alternative to home-grown solutions and proprietary CRVS packages for low resource settings, promoting interoperability and a rights-based approach.

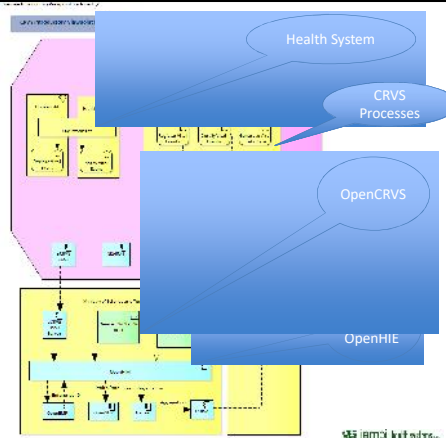
1. Standards based (CRVS + security protocols etc.)
2. Minimum Total Cost of Ownership
3. User-centric design
4. Interoperable with HIS and Identity systems
5. Open source development
6. Modular and configurable for different country contexts



Concept note developed by Plan International on behalf of the APAI-CRVS with contributions from:

- UNECA
- Swiss Tropical and Public Health Institute
- Asia eHealth Information network
- Government of Namibia
- Jembi Health Systems
- Regenstrief Institute
- Statistics Norway







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## SUMMARY



## Challenges

- Legal and governance frameworks
- Privacy and patient confidentiality
- Infrastructure (computers, phones)
- Connectivity (reach and cost)
- Patient/Person Identification
- Capacity and skills
- Cost





## Technical Lessons Learned

- Essential to develop digital solutions with government partners in public health system
- An open architecture and vision is essential to guide implementations and innovation
- Moving to individual level and real-time is challenging but potentially transformative
- Usage is important for high quality data
- At present, interoperability is more about people and organisations than technology
- Use the Principles for Digital Development

<http://digitalprinciples.org>




## Acknowledgements




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This aspect of the MomConnect program was made possible through a partnership between South Africa and the American people





## Thank you

<p><b>Mozambique</b> Avenida Julius Nyerere no 3326 Condominio Diplomatic Village Casa numero um Maputo</p> <p><b>Rwanda</b> Kacyiru Road Plot Number 1760 Kigali</p>	<p><b>South Africa</b></p> <p><b>PHYSICAL</b> Unit D11, Westlake Square, Bell Crescent, Westlake, Cape Town</p> <p><b>POSTAL</b> Postnet Suite 290, Private Bag 326, Tokai 7966, South Africa</p> <p><b>TEL</b> +27 (0)21 701 0939</p> <p><b>FAX</b> +27 (0)21 701 1979</p> <p><b>EMAIL</b> info@jambi.org</p> <p><b>WEBSITE</b> www.jambi.org</p>
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