

Non-linear IMCI

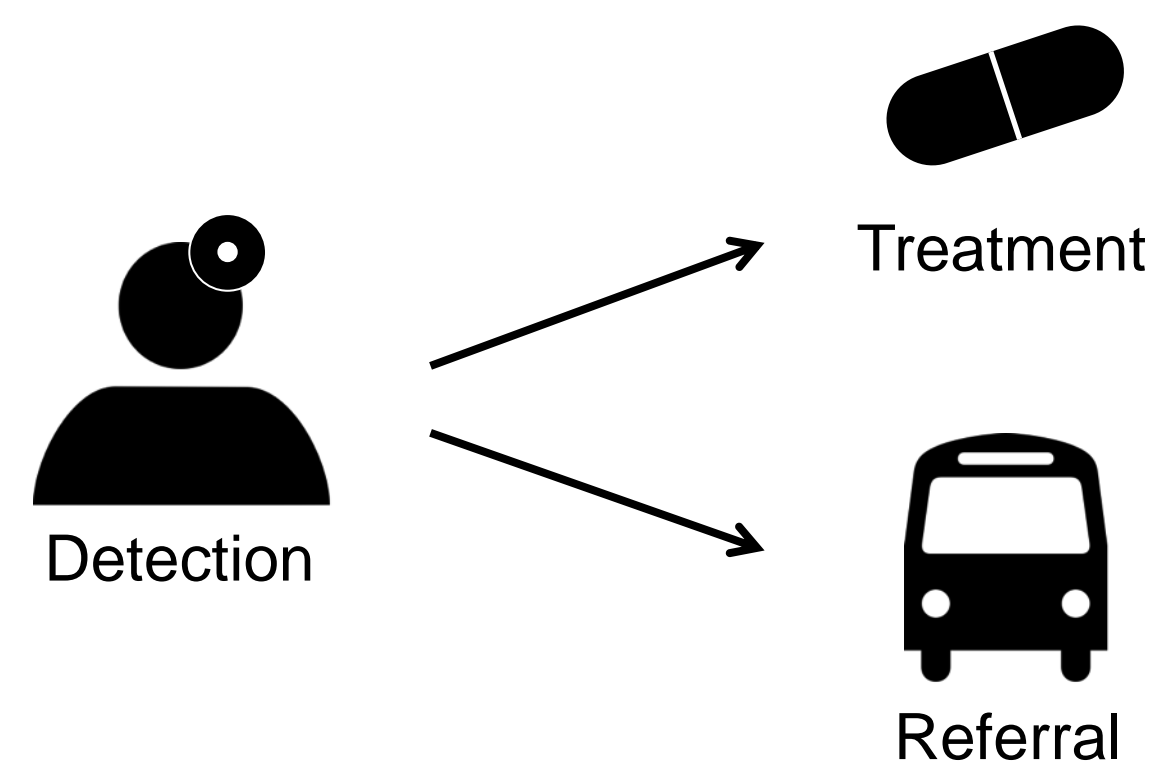
Realigning diagnostics with clinical practice

Bryan Eastes (CSE) – Bennett Ng (CSE) – Adam Rule (HCDE)

Problem

Motivation: 10 million children die each year before their 5th birthday. Most in developing regions. Most from preventable and treatable diseases like pneumonia, diarrhea, and malaria.

Problem: There is a lack of trained medical personal in developing regions who can diagnose these childhood diseases so proper treatment or referral can be given.



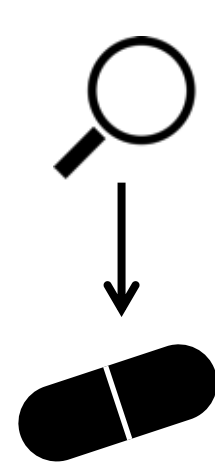
IMCI

Integrated Management of Childhood Diseases (IMCI) is a paper form first developed in 1994 by UNESCO and WHO that guides the user through diagnosing childhood diseases.

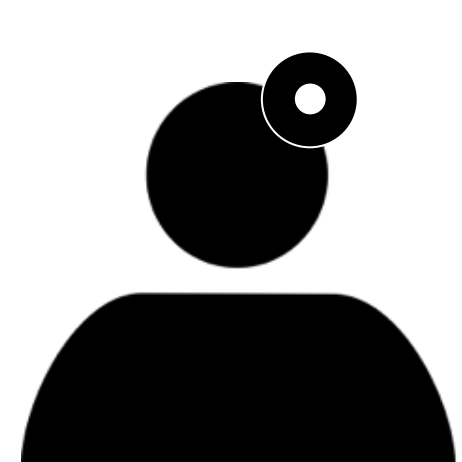
Does the child have diarrhoea?		Two of the following signs: • Loose, watery stools • Stools appear watery • Stools pass back very easily	SEVERE DEHYDRATION • Sunken eyes • Dry mouth and tongue • No tears when crying • Skin pinch goes back very slowly	If a child has no other severe classification: • Classify for severe dehydration (IMCI) • If a child also has another severe classification: • Classify SEVERE DEHYDRATION in addition with another severe classification (IMCI) on the day. • Advise the mother to continue breastfeeding. • If a child is 2 years or older and there is a choice in your area, give oral rehydration solution.
IF YES, ASK: • For how long? • Is there blood in the stool? • Look for other signs: • Ask the child how he/she feels: • Has she been able to drink or eat anything today? • Drinking enough today? • Push the side of the abdomen. Does it get back? • Has she been longer than 2 months?	Classify DEHYDRATION	Two of the following signs: • Sunken eyes • Dry mouth and tongue • No tears when crying • Skin pinch goes back very slowly	SOME DEHYDRATION • Sunken eyes • Dry mouth and tongue • No tears when crying • Skin pinch goes back slowly	If a child also has another severe classification: • Classify SEVERE DEHYDRATION in addition with another severe classification (IMCI) on the day. • Advise the mother to continue breastfeeding. • If a child is 2 years or older and there is a choice in your area, give oral rehydration solution.
		Not enough signs to classify as some or severe dehydration	NO DEHYDRATION	• Give food, oral rehydration, and food to treat diarrhoea at home (IMCI). • Advise the mother to continue breastfeeding. • Follow-up in 5 days if not improving.
and if diarrhoea for 14 days or more	and if blood in stool	Dehydration present	SEVERE PERSISTENT DIARRHOEA	• Give food, oral rehydration, and food to treat diarrhoea at home (IMCI). • Advise the mother to continue breastfeeding. • Follow-up in 5 days if not improving.
		No dehydration	PERSISTENT DIARRHOEA	• Advise the mother on feeding a child who has PERSISTENT diarrhoea. • Give medications with rehydration including zinc for 14 days. • Follow-up in 5 days.
		Stool in the stool	DYSENTERY	• Give ampicillin for 7 days. • Follow-up in 5 days.

IMCI is not used because it:

1. Requires answering a long, rigid, linear set of questions
2. Diagnoses using tests that can be hard to conduct
3. Is not adapted to local medication and referral policies
4. Requires 11 days of training



Workflow



Expertise



Localization



Training

Focus: We want to focus on making the IMCI workflow more flexible.

Field Work

Contacts: We have made valuable contact with:

Jim Black M.D.



- Experience as a clinician in Mozambique
- Currently developing diagnostic tools for feature phones

Amy Ginsburg M.D.

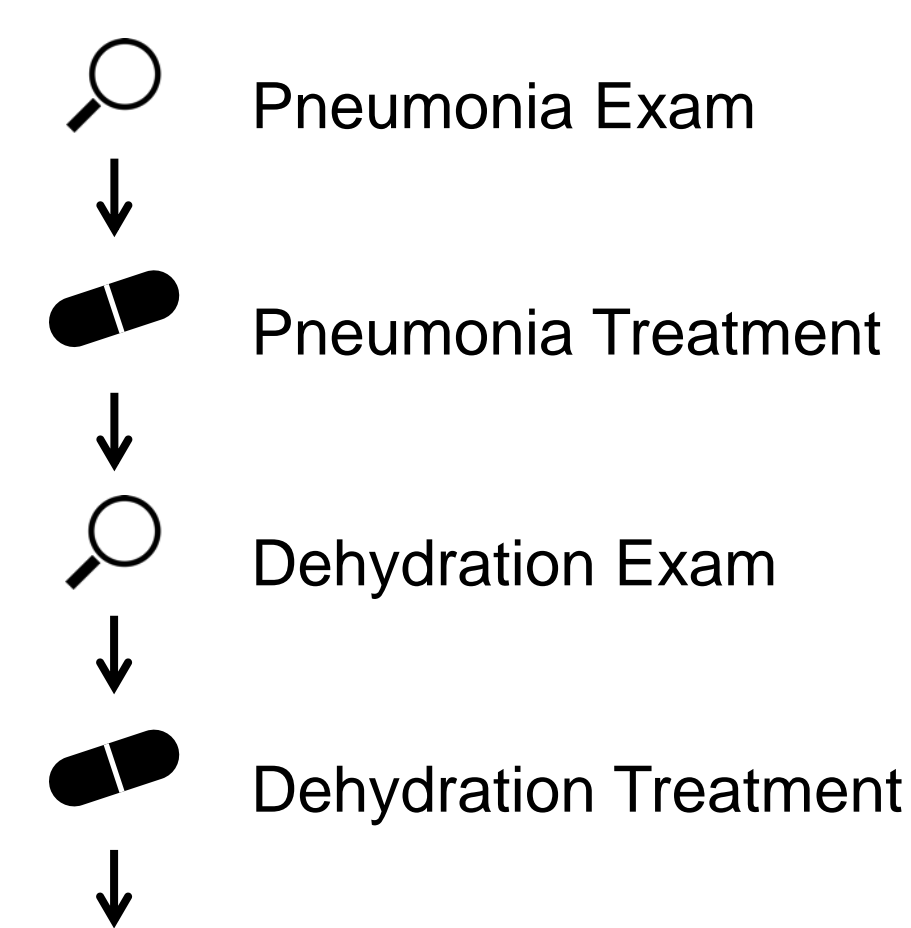


- Extensive experience with IMCI and IMNCI in India
- Clinical experience

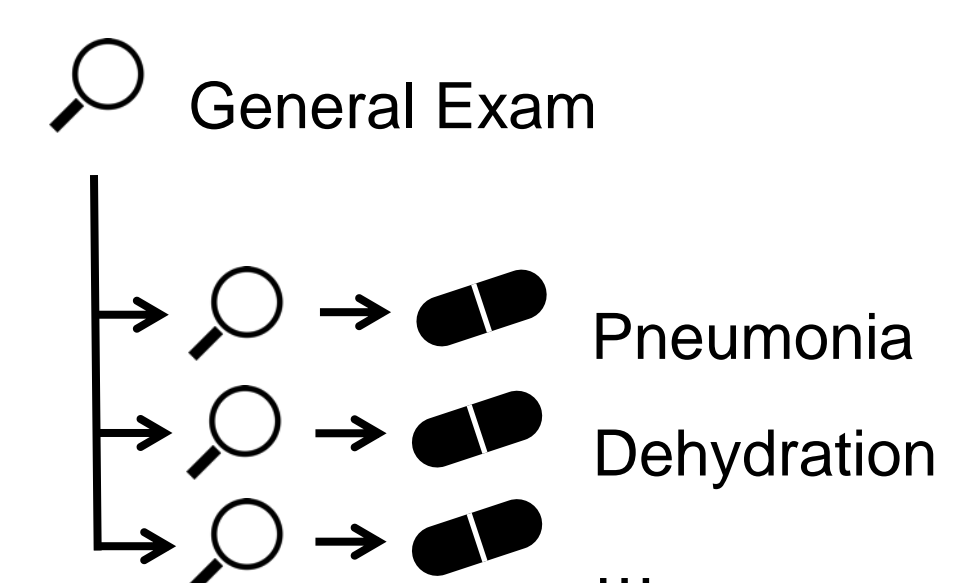
Solution

Flexible Workflow: We will take the linear disease-by-disease paper workflow of IMCI and make it more flexible with a digital version of IMCI on an Android phone that asks a few general questions and then lets the user diagnose potential diseases in a flexible order.

Paper Workflow

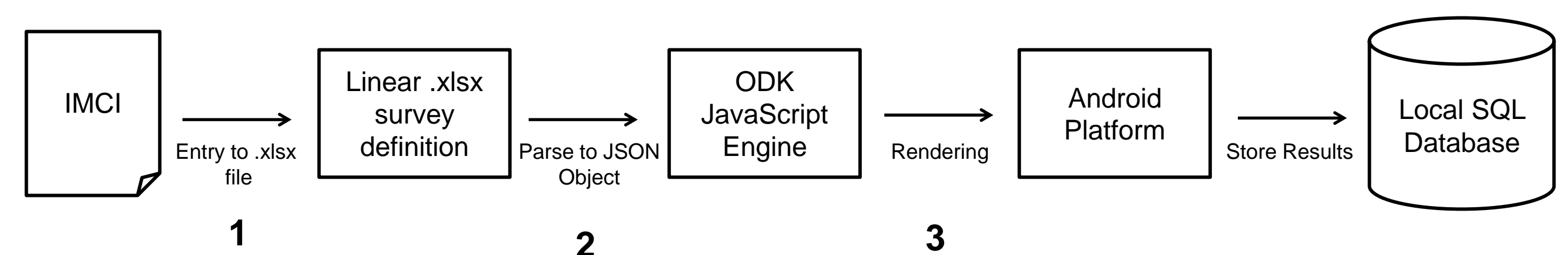


Digital Workflow



Architecture

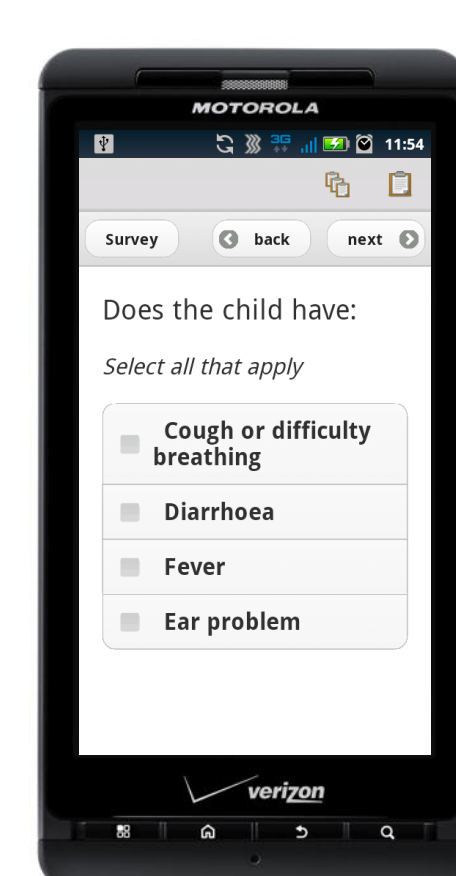
ODK Survey is a survey creation tool that uses Excel files to generate interactive surveys for an Android phone. We will use IMCI as a proof-of-concept as we develop a generalizable solution for creating non-linear surveys ODK Survey.



Our Contribution

1. An entry method that allows for simple description of a non-linear survey
2. A JSON representation that supports non-linear flow
3. A flexible, user-friendly workflow

Prototype & Testing



Prototype: We take inspiration from programs like TurboTax that have an overall linear structure, but allow non-linear navigation (e.g. information does not need to be filled out in order).

Testing: We hope to conduct formative usability tests of our prototype with doctors and nurses in Seattle, leveraging our contacts at PATH.

Timeline

	Week									
	1	2	3	4	5	6	7	8	9	10
Technical	ODK Survey & JavaScript Bootcamp		Prototype Development			Job Aid Development		Final Development		
Social	IMCI Mapping & Prototyping			Job Aid Research & Test Planning		Prototype Testing				
Deliverable			Spec		Midterm paper and presentation				Final paper, poster, and presentation	