

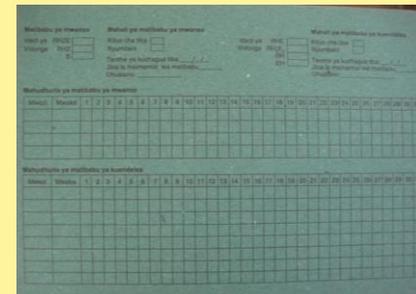


Computing and Global Health

Lecture 3

Last mile data collection and Tracking

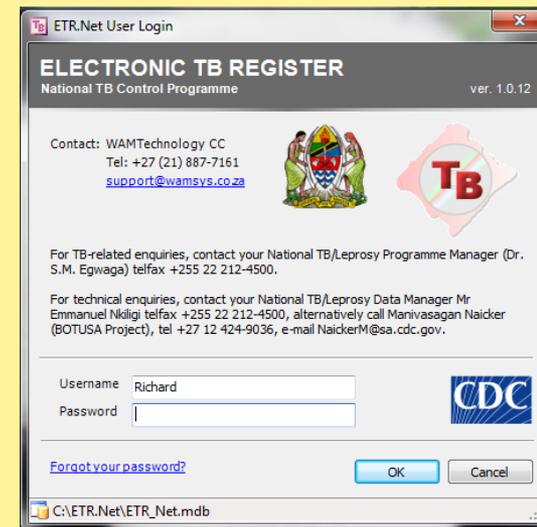
Winter 2015
Richard Anderson



Sl. No.	Name	Age	Sex	Religion	Education	Occupation	Marital Status	Health Status	Other
118	M. 49	Male	Kisumu						
119	M. 25	BUGUSUWA	MALINDI						
120	M. 44	MALINDI							
121	M. 19	CHELEKA							
122	M. 44	BUGUSUWA	MALINDI						
123	M. 26	BUGUSUWA	MALINDI						
124	F. 25	VINDI							
125	F. 25	VINDI							
126	F. 35	VINDI							
127	M. 14	BUGUSUWA	MALINDI						
128	M. 14	BUGUSUWA	MALINDI						
129	F. 49	BUGUSUWA	MALINDI						
130	F. 28	BUGUSUWA	MALINDI						

Today's topics

- Readings and assignments
 - Cold chain assignment review
- HISP Case study – Ghana
- Last mile data reporting
- Tracking vs. Surveillance
- Electronic Registers
 - Challenges



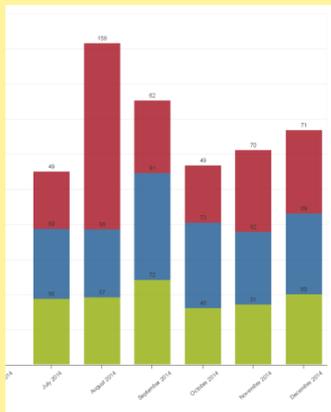
Readings and Assignments

- Homework 2
 - Requirements for aggregating facility reports
- Readings
 - DHIS2 Tracker, Saugene
 - Generic Software Systems
 - Child Health Information Services
 - Biometrics papers

Date	Topic
Jan 7, 2015	Overview
Jan 14, 2015	Surveillance
Jan 21, 2015	Tracking
Jan 28, 2015	Medical records
Feb 4, 2015	Logistics
Feb 11, 2015	Patient support
Feb 18, 2015	Treatment support
Feb 25, 2015	Health worker support
Mar 4, 2015	Behavior change
Mar 11, 2015	Finance

Assignment 3

- DHIS2 Assignment



ANC 1-4 visits by districts this year (stacked) 2014

District	ANC 1st visit	ANC 2nd visit	ANC 3rd visit	ANC 4th or more
Western Area	40	35	25	15
Freetown	45	40	30	20
Bo	50	45	35	25
Kailahun	55	50	40	30
Tonkolili	60	55	45	35
Bombali	65	60	50	40
Moyamba	70	65	55	45
Bonthe	75	70	60	50
Koinadugu	80	75	65	55
Kambia	85	80	70	60

ANC 4+ visits by Facility Type last year 2013, Sierra Leone

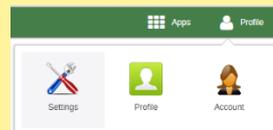
Facility Type	Percentage
CHC	38%
CHP	33%
Hospital	18%
MCHP	10%
Other	4%

ANC 1st visit coverage (%) by district 2013

District	ANC 1 Coverage (%)
Western Area	103.8
Freetown	146.7
Bo	83.5
Kailahun	91.8
Tonkolili	83.2
Bombali	104.9
Moyamba	67.2
Bonthe	94.4
Koinadugu	51.8
Kambia	61.0

ANC: Coverages and reporting by organ unit last year

Organisation unit	2013 ANC 1 Coverage	2013 ANC 3 Coverage	2013 Reproductive Health
Sierra Leone	103.8	67.2	83.3
Bo	146.7	94.4	81.5
Bombali	83.5	51.8	90.5
Bonthe	91.8	61.0	64.4
Kailahun	83.2	72.4	95.3
Kambia	104.9	66.5	90.1

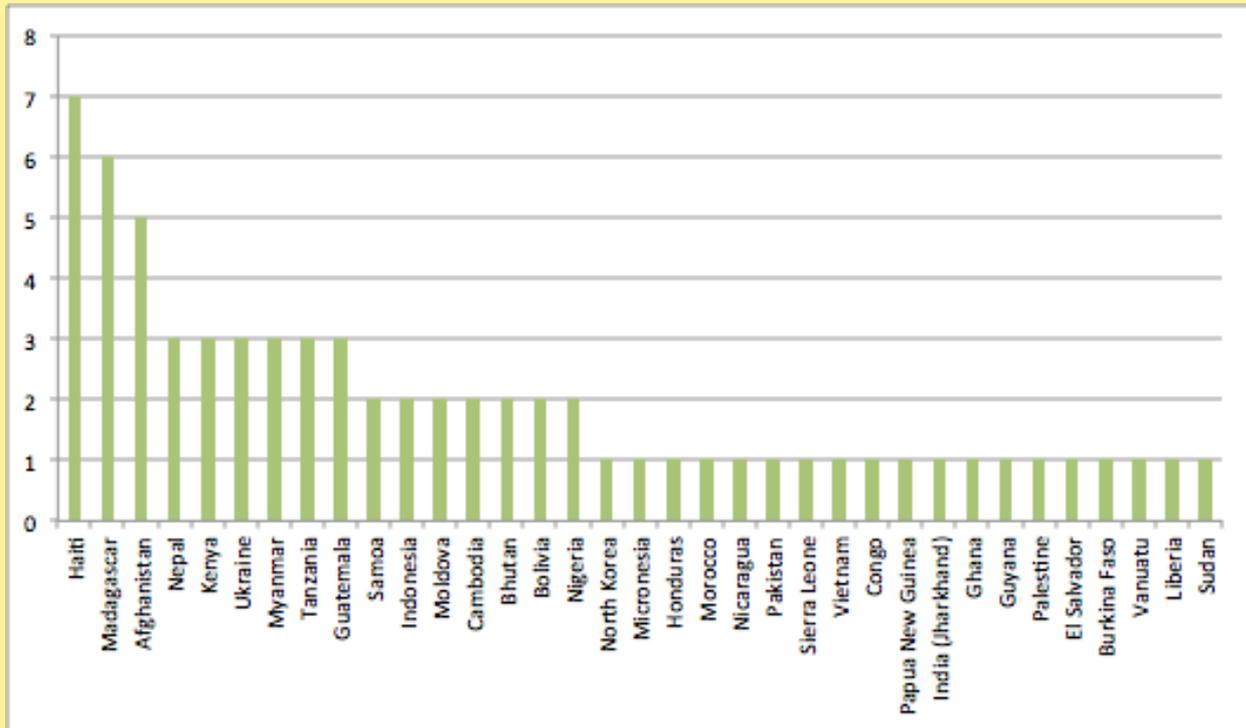
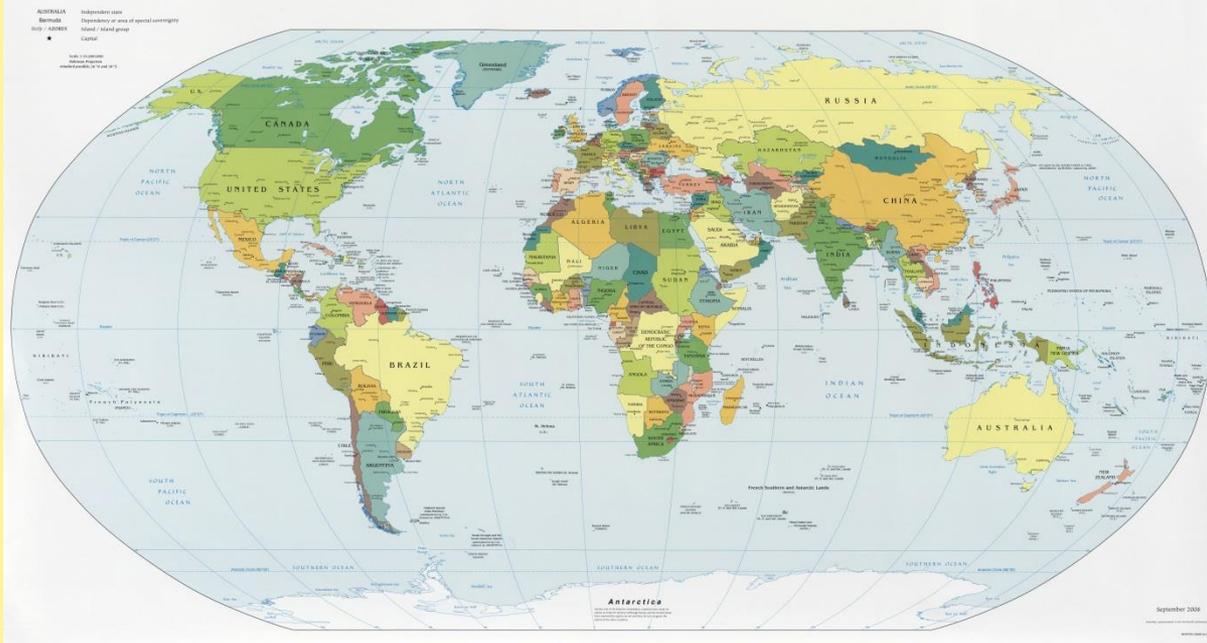


Questions to fahadp@cs

Cold chain data reporting

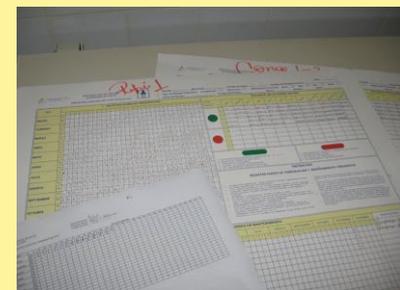
- Distribution of countries
- Burden of Disease
- Cold chain reporting
 - Design a system for reporting ‘up time’ of all refrigerators
 - National surveillance problem
 - Indicator was identified
 - Challenges in getting data, transmitting data, interpreting data

Political Map of the World, September 2008



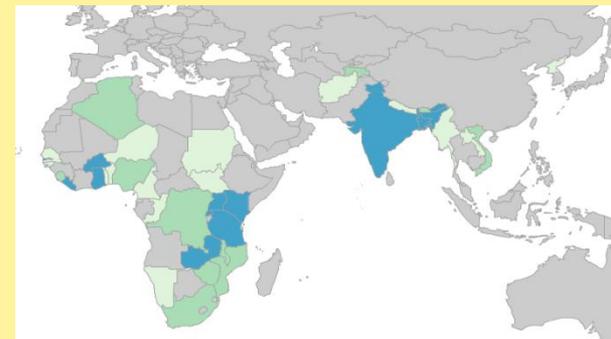
Cold chain data reporting

- Automated reporting linked to server
 - Real time temperature monitoring
- Reporting on temperature loggers
- Reporting of status in monthly report
- Link to existing structures
 - Monthly immunization reporting
 - Refrigerator repair
 - District immunization management



Surveillance summary

- Aggregate data to evaluate the strength of the health system or to meet external requirements
- Indicators
- Data challenges
- Integrated vs. Parallel reporting
- DHIS2



HISP Case Study

- Ghana





Ghana Health Service Dhims 2

[Click here for manual.](#)

dhis2

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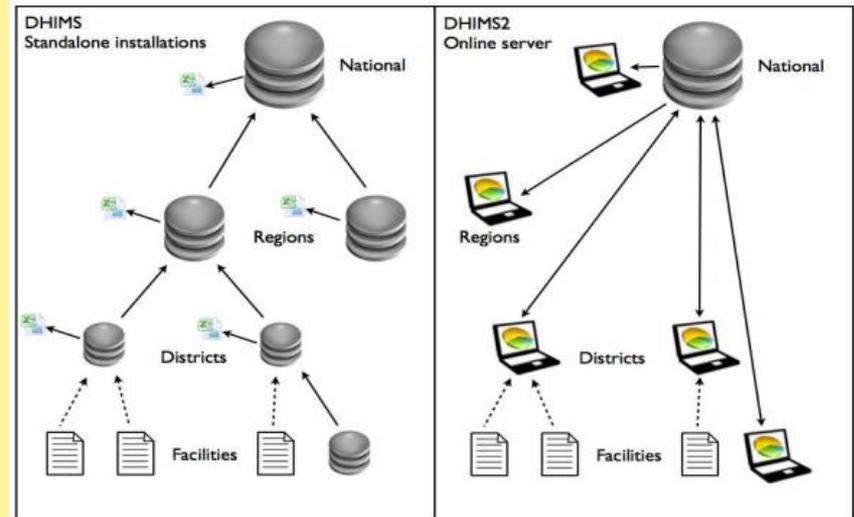
WELCOME TO GHANA HEALTH
SERVICE DHIMS 2

Health Information Systems

- Challenges
 - Collection of irrelevant data
 - Poor data quality
 - Poor timeliness of reporting
 - Parallel and duplicate data collection
 - Low information usage and poor feedback
- Donor driven reporting
 - Lack of requested data elements in national reporting
 - Development of parallel reporting systems

DHIMS

- 2007: Roll out of District Health Information Management System
- 2008: Health Metrics Network (HMN), framework for integrated HIS
- 2011: Implementation of DHIMS2 in DHIS2



DHIMS2 vs. DHIMS

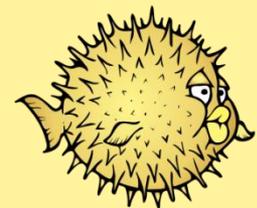
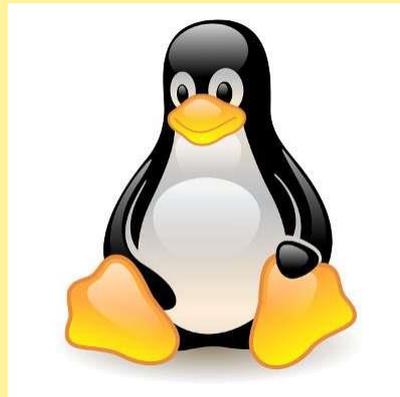
- Centralization of expertise
 - Greater expertise needed, but can be centralize
- Improved data flow and reporting speed
- Increased access to information
 - No longer restricted to a local database
- Consistent national deployment
 - Avoid inconsistent development in different areas
- Substantial capacity development

Why Open Source?

OpenMRS
Open Data Kit
DHIS2
Open LMIS
...



open source



OpenBSD

Last mile data reporting



- Collecting data from health facilities
- Issues
 - Limits on infrastructure
 - Technical background of data reporters
 - Incentives of data reporters
 - Ownership of technology
 - Model for data collecting



Internet

- Must be considered as an option
- Challenges of maintaining a computer at remote sites
- Need to support online/offline data entry



University of Washington, Winter 2015



Feature phone

- Java phones to run applications
- Interest in the technology has declined
- Projects generally targeted a small range of models as portability of applications a challenge
- Feature phones retain some market share as multimedia phones
- Series of mobile phone applications based on XForms



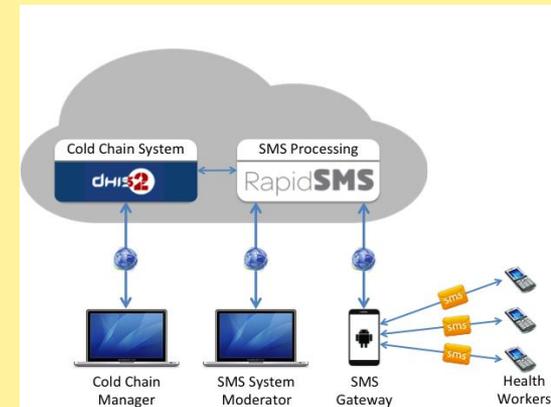


Smart phone / ODK

- Growing interest in utilizing Smart Phones
- Cost and programmability drive interest in Android
- Open Data Kit
 - University of Washington developed system for data collection on mobile phones
 - Forms based application running on Phone
 - Back end system for aggregating submissions
 - Goal to make it easy for organizations to deploy survey tools on smart phones
 - Example: IHME deployment of verbal autopsy tool
 - Common approach, collect data on a tablet, and sync data by wifi when back in the office

SMS

- Data submission by raw text messages, interpreted by server
- In many cases, it can be assumed everyone has access to an SMS phone
- Challenges if a large amount of data is required



Paper to Digital

- Scan paper forms
- Allows entry on paper (which is easier)
- Reduces manual entry
- More later . . .



Device ownership

- Personally owned versus provided devices
- Computers – generally facility devices
- Mobile phones
 - Personal
 - Cheaper to the project
 - Incentives to keep charged
 - Heterogeneous
 - Must support lowest common denominator
 - Provided
 - Can be costly
 - Substantial effort to manage
 - Security risks
 - Training
 - Allow uniform deployment environment
 - Can be a mismatch with target users
 - Potential for cross project utilization



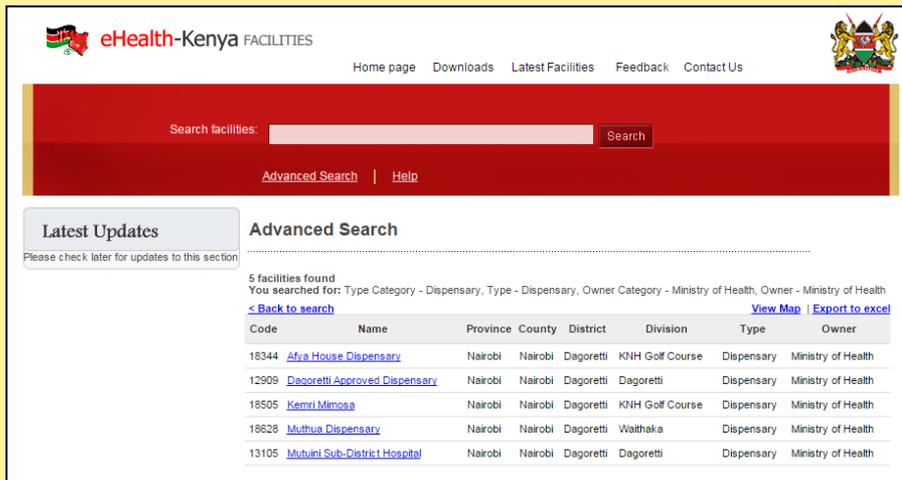
Who collects the data

- Health workers
- Dedicated data collectors
- Derived or automatically collected



Health Information Systems challenge: Generating a Master Facility List

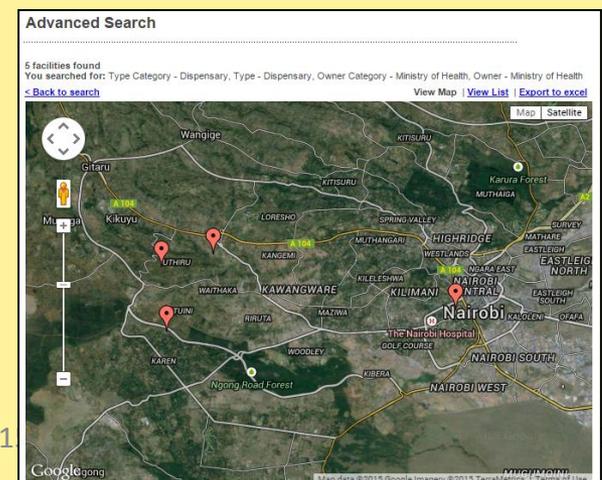
- MFL – list of all health facilities in the country
 - Facility ID (Primary key)
 - Classification by services
- Best case: Kenya
 - <http://www.ehealth.or.ke/facilities/>



The screenshot shows the eHealth-Kenya FACILITIES website. At the top, there is a navigation menu with links for Home page, Downloads, Latest Facilities, Feedback, and Contact Us. Below the menu is a search bar with the text "Search facilities:" and a "Search" button. There are also links for "Advanced Search" and "Help".

Under the "Latest Updates" section, there is a "Please check later for updates to this section" message. Below that, the "Advanced Search" results are displayed, showing 5 facilities found. The search criteria are: Type Category - Dispensary, Type - Dispensary, Owner Category - Ministry of Health, Owner - Ministry of Health. There are links for "Back to search", "View Map", and "Export to excel".

Code	Name	Province	County	District	Division	Type	Owner
18344	Afyu House Dispensary	Nairobi	Nairobi	Dagoretti	KNH Golf Course	Dispensary	Ministry of Health
12909	Dagoretti Approved Dispensary	Nairobi	Nairobi	Dagoretti	Dagoretti	Dispensary	Ministry of Health
18505	Kenri Mimosa	Nairobi	Nairobi	Dagoretti	KNH Golf Course	Dispensary	Ministry of Health
18628	Muthua Dispensary	Nairobi	Nairobi	Dagoretti	Wathaka	Dispensary	Ministry of Health
13105	Mutuni Sub-District Hospital	Nairobi	Nairobi	Dagoretti	Dagoretti	Dispensary	Ministry of Health



The screenshot shows the "Advanced Search" map interface. It displays a satellite map of Nairobi, Kenya, with 5 facilities marked by red location pins. The map includes a search bar at the top with the text "5 facilities found" and "You searched for: Type Category - Dispensary, Type - Dispensary, Owner Category - Ministry of Health, Owner - Ministry of Health". There are links for "Back to search", "View Map", "View List", and "Export to excel". The map also shows a compass, a scale bar, and a "Map" button. The text "gton, Winter 201" is visible at the bottom left of the map area, and "24" is at the bottom right.

Challenges in building MFL

- List all public health facilities
 - Determine which ones are active
 - Identify new facilities
 - Resolve duplicate names
- Determine other types of facilities to include
 - Private, Faith based
- Establish unique ID codes
 - Central administration of list

Laos Facility List, MOH vs NIP

0803001	80301	Phoulaeng	ຜູ້ແລ້ງ Phuleng
0803002	80302	Thasouang	ທ່າຊ່ວງ Thasuang
0803003	80303	KhokAek	ຄົກແອກ Kockeak
0803004	80304	Napoung	ນາປຸ່ງ Napung
0803005	80305	Namsib	ນ້ຳສິບ Namsip
0803006	80306	Ban Harn	ຫານ Han
0804001	80401	BanThong	ບ້ານທອງ Banthong
0804002	80402	HouaiGneui	ຫ້ວຍເງືອນ Huaunhuen
0804003	80403	NaNhang	ນາຍາງ Nanhang
0804004	80404	Pnagbong	ປາງບົງ Pangbong
0804005	80405	Phadaeng	ຜາແດງ Phadeng
0804006	80406	Houaipheuang	ຫ້ວຍເຜິ້ງ Hauptheug
0805001	80501	Phoulane	ປາກເປັດ Pakpet
0805002	80502	Parkpet	Dong
0805003	80503	Dong	Homso
0805004	80504	Holmxai	Huamueng
0805005	80505	Houameuang	Huana
0805006	80506	Houana	Huaunhouck
0805007	80507	HouaiYourk	Phulan (Thonhkang)
0806001	80601	Naxing	ນາຊິງ Nasing
0806002	80602	Nakhaem	ນາແຄມ Nakhem
0806003	80603	Phadam	ຜາດຳ Phadam
0806004	80604	Navaen	ນາແວນ /(ນາ ສ້າພັນ) Naven/Nasamphan
0806005	80605	Pholthong	ໂພນທອງ Phonthong
0806006	80606	PholsaArd	ໂພນສະອາດ Phonsaat
0806007	80607	Pongvang	ປົງວາງ Pongvang
0806008	80608	Holmxai	ໂຮມໄຊ(ນ້ຳງື່ມ) Homsay/Namnuem

Registers

- What are registers
- Surveillance vs. Tracking vs. Medical Records

Immunization cards

0-6 वर्ष
 0-6 वर्ष के बच्चों के लिए टीकाकरण कार्यक्रम
 0-6 वर्ष के बच्चों के लिए टीकाकरण कार्यक्रम
 0-6 वर्ष के बच्चों के लिए टीकाकरण कार्यक्रम

0-6 वर्ष के बच्चों के लिए टीकाकरण कार्यक्रम
 0-6 वर्ष के बच्चों के लिए टीकाकरण कार्यक्रम
 0-6 वर्ष के बच्चों के लिए टीकाकरण कार्यक्रम

DT	Date Rendre-vous	Date vaccination	Lot N°
Hépatite B	Date Rendre-vous	Date vaccination	Lot N°
BCG	Date Rendre-vous	Date vaccination	Lot N°
Penta DTIC-HIV-Hib	Date Rendre-vous	Date vaccination	Lot N°
Polio	Date Rendre-vous	Date vaccination	Lot N°
Rougeole	Date Rendre-vous	Date vaccination	Lot N°
DTIC	Date Rendre-vous	Date vaccination	Lot N°

VACCINS	Rappel calendrier des enfants de 0 à 11 mois	Date de Vaccination	N° Lot	Cachet et signature du Vaccinateur	Date de Rendre-vous
BCG	A la naissance jusqu'à 15 jours				
VPO	0 Dose De la naissance à 15 jours 1 ^{re} Dose A partir d'un mois et demi 2 ^{ème} Dose A partir de 2 mois et demi 3 ^{ème} Dose A partir de 3 mois et demi				
DTIC-HepB + Hib	1 ^{re} Dose A partir d'un mois et demi 2 ^{ème} Dose A partir de 2 mois et demi 3 ^{ème} Dose A partir de 3 mois et demi				
PCV 13	1 ^{re} Dose A partir d'un mois et demi 2 ^{ème} Dose A partir de 2 mois et demi 3 ^{ème} Dose A partir de 3 mois et demi				
VAR	A partir de 9 mois				
VAR VITAMINE A 100.000 U.I.	A partir de 9 mois				
VAR CAMPAGNE	De 6 à 11 mois				

PROGRAMA AMPLIADO DE INMUNIZACIÓN (PAI) REGISTRO DE VACUNACIÓN DEL NIÑO

Tipos de Vacunas	Fecha en que se aplicó la vacuna*					
	Dosis a Recién Nacido	1° DOSIS	2° DOSIS	3° DOSIS	1° REFUERZO	2° REFUERZO
BCG						
ANTI-HEPATITIS B						
ANTIPOLIOLIO						
FEBRILANTE (DPT, Hib, Hib)						
DPT						
SRP						
SARAMPION						
OTRAS						

VACINAS DEL ESQUEMA BÁSICO
 SI FALTABA VACINA COMBINADO (PENTA) SÍ APLICAR VACUNAS POR SEPARADO
 NO CORRESPONDE APLICAR VACINAS
 VACINAS QUE NO ESTÁN EN ESQUEMA BÁSICO

Nature du Vaccin	Dose Naissance	Dose 1	Dose 2	Dose 3	Dose 4	Dose 5
Vitamine A						
Polioomyélite						
BCG						
Pentavalent (DTC-HIP)						
Rougeole						
Fèvre Jaune						
Vitamine A						

Dose (inscrire dans chaque case, la date d'administration et cacheter)
 Ne pas oublier d'inscrire la date du prochain rendez-vous sur la carte de vaccination
 Et le accompagner seulement au parent
 Assurez-vous que le rendez-vous correspond à une séance de vaccination prévue.

VACCINATION ANTITÉTANIQUE CHEZ LA FEMME ENCEINTE

VACCIN ANTITÉTANIQUE	PÉRIODE DE L'INJECTION	DURÉE DE PROTECTION DU VACCIN
VAT 1	A la 1 ^{ère} CPN	Pas de protection
VAT 2	4 semaines après le VAT 1 ; à la 2 ^{ème} CPN	3ans
VAT 3	6 mois après le VAT 2	5 ans
VAT 4	1 an après le VAT 3	10 ans
VAT 5	1 an après le VAT 4	Protection à vie

DOSES	DATE	LOT N°	CACHET DU SERVICE
1 ^{re} dose			
2 ^{ème} dose			
1 ^{er} rappel			
2 ^{ème} rappel			
3 ^{ème} rappel			

N.B. : 1. La mère et l'enfant ne sont pas protégés si la vaccination débute après le 8^{ème} mois.
 2. Ne pas se faire vacciner pendant la grossesse.

AUTRES VACCINATIONS CHEZ LA FEMME ENCEINTE

VACCINATIONS CONTRE	DATE	LOT N°	CACHET DU SERVICE
Hépatite B*			
1 ^{re} dose :			
2 ^{ème} dose :			
3 ^{ème} dose :			
AUTRES VACCINATIONS			
DATE			
LOT N°			
CACHET DU SERVICE			

N.B. : La vaccination contre l'hépatite B chez la femme enceinte n'est pas systématique. Elle est fonction des résultats du dosage de l'AgHBs, de l'anticorps anti-HBc et autres marqueurs de l'hépatite B. En cas de doute, ou de difficulté pour les interpréter, référer la femme enceinte dans un service spécialisé (Hépatite-Gastro-entérologie ou Médecine Interne).

PROGRAMA AMPLIADO DE INMUNIZACIÓN (PAI) Guía de Vacunación de Niños

Enfermedad que evita	Recién nacido	Edades (Meses / Años) Óptimas para la Vacuna					
		2° mes	4° mes	6° mes	12° mes	18° mes	4 - 6 años
TUBERCULOSIS	BCG (bifido)						
HEPATITIS B	HB (bifido)	HB 1° Dosis	HB 2° Dosis	HB 3° Dosis			
POLIOMIELITIS	VPO (bifido)	VPO 1° Dosis	VPO 2° Dosis	VPO 3° Dosis	VPO 1° Refuerzo	VPO 2° Refuerzo	
DIFTERIA, TOS FERINA Y TETANOS Y LAS INFECCIONES BACTERIALES POR Hib (Meningitis)	Penta (bifido)	Penta 1° Dosis	Penta 2° Dosis	Penta 3° Dosis			
DIFTERIA, TOS FERINA Y TETANOS					DPT 1° Refuerzo	DPT 2° Refuerzo	
SARAMPION, RUBEOLA Y PAPERAS					SRP/R 1° Dosis	SRP 1° Refuerzo	
INFLUENZA (FLU O GRIPE)					Flu 1° Dosis	Actualizar cada año	
FIEBRE AMARILLA (FA)						FA (cada 6 meses)	

* La BCG debe ponerse al nacimiento, de no ser así, lo más pronto posible.
 ** Flu - Vacuna trivalente, dentro de los 48 horas después del parto.
 *** No especificaciones del fabricante y cantidad epidemiológica. Dosis de 0.5 ml y menor de 2 años, refuerzo 0.25 ml y mayor de 2 años.
 **** No se debe administrar esta vacuna a niños con inmunodeficiencia o inmunosupresión.

Immunization

- Routine immunization
- Track immunizations received and dates of immunization

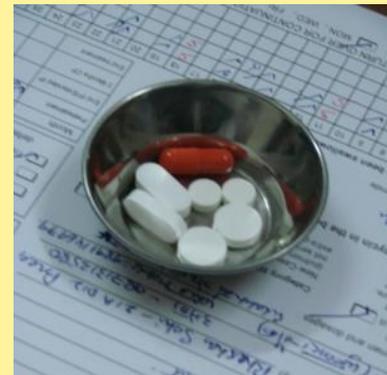
Revised EPI Schedule Post-New Vaccine Introduction	
BCG	At birth
OPV 1 Pentavalent 1 PCV 1 Rotavirus 1	6 weeks
OPV 2 Pentavalent 2 PCV 2 Rotavirus 2	10 weeks
OPV 3 Pentavalent 3 PVC 3	14 weeks
Measles	9 months
DPT Booster OPV Booster	18 months

Table 2: Immunization schedule, 2011

Vaccine	Age of administration
BCG	At birth
DTP-Hib-HepB	6 weeks, 10 weeks, 14 weeks
OPV	6 weeks, 10 weeks, 14 weeks, 38 weeks
Measles	38 weeks
TT	+15 Years (WCBA 15-49 Yrs), + 1 month, + 6 months, + 1 year, + 1 year
Vitamin A	38 weeks

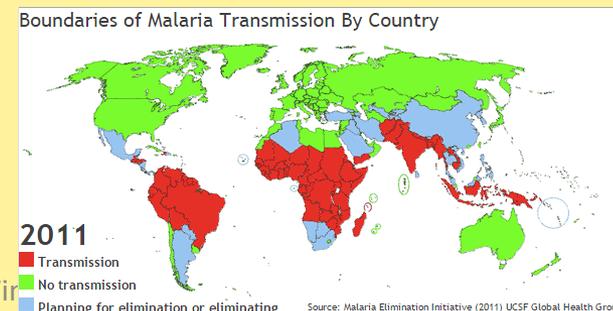
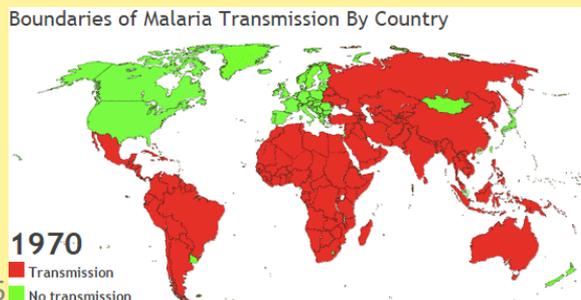
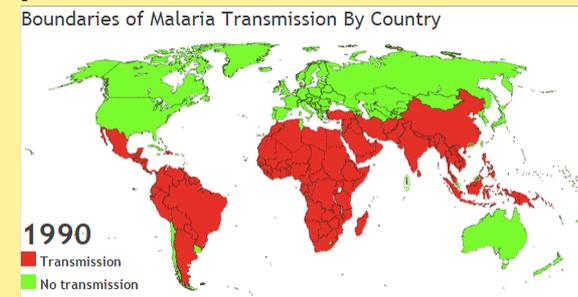
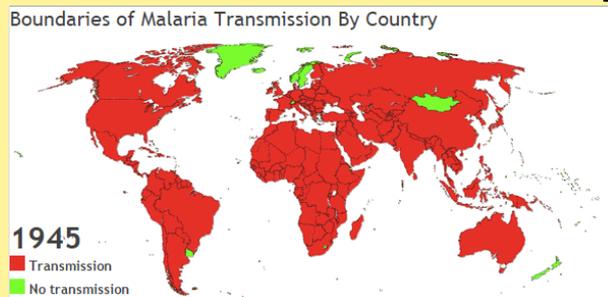
Infectious Disease

- Tuberculosis
 - Processes established for identification and treatment
 - Strict regimen of treatment
 - Two months of Isoniazid, Rifampicin, Pyrazinamide, Ethambutol
 - Four months of Isoniazid, Rifampicin
 - Testing at completion
- TB Record
 - Testing dates
 - Medication



Case tracking

- Identification of carriers of specific diseases
 - Malaria (for complete eradication)
 - Measles (exposure tracking)
 - Acute Flaccid Paralysis (AFP)



Maternal Health

- Tracking mothers through pregnancy
- Registration of pregnant women
- Antenatal care visits

Integrated Child Development Services
National Rural Health Mission



Photograph of Mother & Child

Family Identification

Mother's Name _____ Age _____
 Father's Name _____
 Address _____
 Mother's Education: illiterate/primary/middle/high school/graduate

Pregnancy Record

Mother's ID No. _____
 Date of the last menstrual period: / /
 Expected date of delivery: / /
 No. of pregnancies/ previous live births: / /
 Last delivery conducted at: Institution Home
 Current delivery: Institution Home
 JSY Registration No. _____
 JSY payment Amount _____ Date: / /

Birth Record

Child's Name _____
 Date of Birth: / / Birth Weight: _____ kgs _____ gms
 Sex: Girl Boy Birth Registration No.: _____

Institutional Identification

AWW _____ AWC/Block _____
 ASHA _____ ANM _____
 SHC / Clinic _____
 PHC / Town _____ Hospital / FRLI _____
 Contact No. ANM _____ Hospital _____
 Transport Arrangement _____

AWC Reg. No. _____ Date: / / Sub-centre Reg. No. _____ Date: / /
 Referral: _____

Ministry of Women & Child Development, Government of India
 Ministry of Health and Family Welfare, Government of India

Regular checkup is essential during pregnancy

Months: 1 2 3 4 5 6 7 8 9 10 11 12

Registration
 Register with the health centre in the first trimester.

ANC
 Have at least 3 antenatal checkups, after registration.

BP: Blood & Urine
 Have blood pressure (BP) checked and blood and urine examined at each visit.

Weight
 Have weight checked at each visit. Gain at least 10-12 kg. during pregnancy. Gain at least 1kg every mth. during the last 6 mths. of pregnancy.

T.T. Injection
 Take two T.T. injections. T.T.1 when pregnancy is confirmed and T.T.2 after 1 month. (Fill in the date)

Iron Tablets
 Take one tablet of iron and folic acid a day for at least 3 months. Take at least 100 tablets. (Fill in quantity and date issued)

Care During Pregnancy

- Consume a variety of foods
- Consume more food – around 1½ times extra than the normal diet
- Consume SNP from the AWC regularly
- Take at least two hours of rest during the day. In addition to 8 hours of rest at night
- Use only adequately iodised salt

Ensure nutrition counselling at every ANC

ANTENATAL CARE

OBSTETRIC COMPLICATION IN PREVIOUS PREGNANCY
 (Please tick (✓) the relevant history)

A. APH B. Eclampsia C. PIH
 D. Anaemia E. Obstructed labor F. FPH
 G. LSCS H. Congenital anomaly in baby I. Others

PAST HISTORY
 (Please tick (✓) the box of the appropriate response/s)

A. Tuberculosis B. Hypertension C. Heart Disease
 D. Diabetes E. Asthma F. Others

EXAMINATION

General Condition	Heart	Lungs	Breasts

ANTENATAL VISITS

	1	2	3	4
Date				
Any complaints				
PCOG (Weeks)				
Weight (Kg)				
Pulse rate				
Blood pressure				
Pallor				
Oedema				
Jaundice				

ABDOMINAL EXAMINATION

	Normal/Reduced/Absent	Normal/Reduced/Absent	Normal/Reduced/Absent	Normal/Reduced/Absent
Fundal height Weeks/cm				
Lie/Presentation				
Fetal movements				
Fetal heart rate per minute				
P/V if done				

ESSENTIAL INVESTIGATIONS

Hemoglobin _____
 Urine albumin _____
 Urine sugar _____
 Signature of ANM _____

Blood Group & Rh Typing: _____ Date: / /

OPTIONAL INVESTIGATIONS

1. Urine pregnancy test: _____ Date: / /
 2. HbA1c: _____ Date: / /
 3. Blood sugar: _____ Date: / /

Participate in monthly fixed village Mother Child Health & Nutrition Day

Health use cases

- Surveillance
 - More accurate than reporting events
 - Better estimates of coverage
- Tracing defaulters
- Disease elimination
- Care and program planning
- Reporting
- Reminders
- Formalizing care
- Coordination of care across providers

Challenges

- Unique identifier
- Biometrics
- Name resolution
- On-line, off-line mode
- Undocumented people
- Conflict zones
- Privacy

How do we track people

- National or patient ID
 - How are IDs assigned
- Alternate IDs
 - Facebook, email, mobile number
- Mother's name
- Name
 - Name and birthdate
 - Name and birthdate and village
 - Name and birthdate and village and father's name
 - Name and birthdate and village and father's name and fathers village

Patient ID

- Generate health ID
- Provide to patient on paper or a smart card



Biometrics

- Some large initiatives based on biometrics
 - Finger prints, Iris
- Finger prints are challenging for young children



f Washington, Winter 2015



Name resolution

- Additional challenges in the developing world
 - Lack of records
 - Spelling of names
 - Imprecise dates

Richard G Anderson Age: 65+ Lives in: Seattle WA	Knows: Donald J Milne, Hewan Gebre Lived in: Seattle WA, Minneapolis MN
Richard G Anderson Age: 65+ Lives in: Seattle WA	Knows: Peter A Anderson Lived in: Seattle WA, Bellevue WA
Richard E Anderson Age: 65+ Lives in: Seattle WA	Knows: Sally J Mitchell, Eula M George Lived in: Seattle WA, Seatac WA, Kent WA
Richard P Anderson Age: Unknown Lives in: Seattle WA	Knows: Jean A Kent, Raymond E Glaser Lived in: Seattle WA, Salt Lake City UT
Richard A Anderson Age: 65+ Lives in: Seattle WA	Knows: Ruth W Anderson, Paula J Anderson Lived in: Seattle WA, Poulsbo WA
Richard Anderson Age: Unknown Lives in: Seattle WA	Knows: Richard V Palmer III, Lauretta Lived in: No known previous cities
Richard B Anderson Age: 65+ Lives in: Seattle WA	Knows: Leanna M Anderson, Zen F Anderson Lived in: Seattle WA, Everett WA
Richard L Anderson Age: 65+ Lives in: Seattle WA	Knows: No known associations Lived in: Ashland OR, Los Gatos CA
Richard F Anderson Age: Unknown Lives in: Seattle WA	Knows: No known associations Lived in: Seattle WA, Shelton WA, Freeport WA
Richard C Anderson Age: 50-54 Lives in: Seattle WA	Knows: Shawn M Anderson Lived in: No known previous cities

On-line, off-line access

- Standard synchronization problems
- In practice this is much harder than it should be

The screenshot displays the Digital Green System COCO interface. At the top, it reads "Digital Green System COCO | Connect Online, Connect Offline". Below this is a navigation bar with "connect online" and "connect offline" options. A green status bar indicates "Your data has been uploaded. Local database is in sync with the main server." The main content area is divided into three sections: "Administration" with a list of system components (Animators, Blocks, etc.), a central "Welcome to COCO" message with "Go Offline", "Download", and "Upload" buttons, and "Instructions & Tips" on the right.

Digital Green System
COCO | Connect Online, Connect Offline

connect online | connect offline

Your data has been uploaded. Local database is in sync with the main server.

Administration

- Animators assigned villages
- Animators
- Blocks
- Development managers
- Districts
- Equipments
- Field officers
- Languages
- Partners
- Person groups
- Personnes
- Practices
- Regions
- Screenings
- States
- Traillegs
- Videos
- Villages

Welcome to COCO, DigitalGreen's connect-online, connect-offline system -- from anywhere, to everywhere.

Connected in online mode..

Go Offline

Download Upload

Instructions & Tips

- Before going offline, click on the 'Download' button to download a local copy of the main server to your browser. Then click on the 'Go Offline' button to access and add information in offline mode.
- You can now edit or add information in offline mode. After you're done, click on the 'Go Online' button to upload any newly edited or added information to the main server. You can do this by clicking on the 'Upload' button.
- Make sure you have internet access before clicking on the 'Go Online' button. Some level of internet access is necessary to download and upload data to the main server.

www.digitalgreen.org/tech

Undocumented people

- Clearly, this is a complicated, political issue
- Delivery of services to people without official status
- Maintain separate registration
- Alternate means of identification

Register/Tracker Implementations

- Many stand alone implementation
 - Simple database backend
- Extract information from a medical record system
- Extension of DHIS2
 - Tracker is a new data model