

# GLOBAL GOODS OPEN MIC WEBINAR

Smart Guidelines Implementation  
*Featuring OpenMRS and OpenSRP*

**Welcome!**

Please share in the chat:

**What do you already know about  
SMART guidelines?**



# FHIR & SMART Guidelines

Global Good Open Mic



OpenMRS  
MEDICAL RECORD SYSTEM

ONN

# Panelists



**Grace Potma**  
Director of  
Product



**Suruchi  
Dhungana**  
Community  
Business Analyst  
& Product  
Management  
Fellow



**Peter  
Lubell-Doughtie**  
CTO



**Roy Munge**  
Engineering  
Manager



**Ben Mwalimu**  
Technical  
Program  
Manager

# Outline & Session Learning Goals

- SMART Guidelines & FHIR 101 (*10 mins*)
  - Basic understanding of SMART guidelines
  - Basic understanding of FHIR plandefinitions vs careplans and how these can be used
  - Basic understanding of FHIR IGs and how they are used for CDS or reporting calculations
- Lessons from Ona (*15 mins*)
  - **Vaccination Scheduling:** Careplan for newborn, COVID vax, tasks and dependencies between them
  - **ANC** Careplan Generation from PlanDefinitions
- Lessons from OpenMRS (*15 mins*)
  - **ANC CDS: Preeclamsia rule:** FHIR IG ANC → CQL Engine/CQL-API Module → CDS rule
  - **MER Indicator:** FHIR IG TX\_Curr → CQL Engine + OCL → Indicator
- Implementation Challenges (*5 mins*)
- Next Steps (*5 mins*)
- Q&A (*10 mins*)

# SMART Guidelines & FHIR 101



# WHO SMART Guidelines

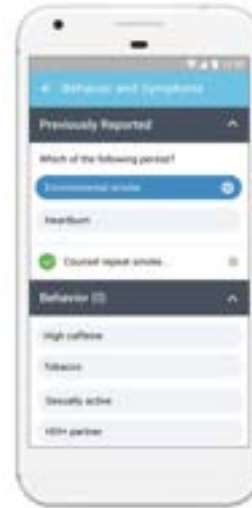


Narrative &  
Operational  
Guidelines  
**L1 + L2**



(Logic + Data  
Model)

Machine Readable  
Guidelines (FHIR)  
**L3**



Executable Guidelines  
**L4**

e.g.  OpenMRS  OPENSERP

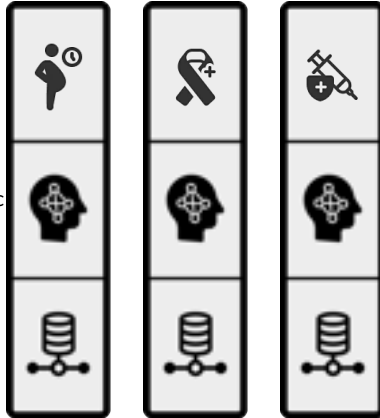
# Traditional vs. standards-based health architecture

Traditional = siloed

vs.

Standards-based = modular

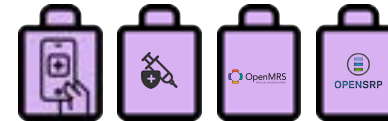
Custom Platforms



Custom App Logic

Proprietary Data Models

Standards-based Platforms



Standards based App Logic



Standardized Data Model





# SMART Recipe: What do you need?

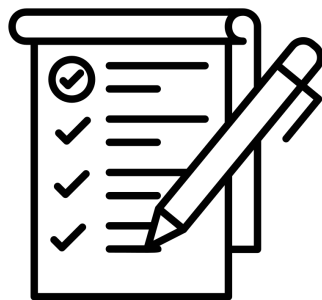


Ingredients:		Tools Needed for Global Goods ecosystem
• Terms/concepts	→	<b>Agnostic: OCL.</b>
• Forms	→	(Form builder)
• Way to write the rules in software	→	<b>Agnostic: CQL syntax/language.</b> <b>Agnostic: FHIR planDefinitions</b>
• A brain/engine the software uses to calculate those rules	→	<b>Agnostic: CDS Engine / brain → CQL-Evaluator/Engine</b>
• A way to inform end-users of the result	→	<b>Display!</b> Beyond a Popup Modal: Flags, Tasks, Follow-up Lists, etc.

# FHIR plandefinitions vs careplans

## Plan Definition:

A pre-defined group of actions to be taken in particular circumstances. Used to represent workflows, clinical decision support rules, order sets, and protocols.



Encoded guidelines

## Care Plan:

In this case: **Decision support generated** plans following specific practice guidelines (e.g. stroke care plan, diabetes plan...)



Only what's relevant for  
that patient

# Example: Pre-eclampsia PlanDefinition

"resourceType": "PlanDefinition",  
"title": "ANC.DT.17 Pre-eclampsia, severe pre-eclampsia and hypertension diagnosis",  
"description": "If the woman presents with any of the following symptoms and/or test results, conduct counselling and referral as needed",  
"id": "1", "title": "Refer urgently to a hospital",  
"textEquivalent": "Symptom(s) of severe pre-eclampsia! Refer urgently to hospital!.....  
"description": ""Systolic blood pressure\"  $\geq$  140 mmHg)\n AND (\nRepeat systolic blood pressure\"  $\geq$  140 mmHg)\n AND (\nSymptoms of severe pre-eclampsia\" = \nSevere headache\")\n OR ((\nDiastolic blood pressure\"  $\geq$  90 mmHg)\n AND .....  
"id": "4", "title": "Conduct hypertension counselling",  
"textEquivalent": "Woman has hypertension – SBP of 140 mmHg or higher and/or DBP of 90 mmHg or higher and no proteinuria.\n\nCounselling:\n– **Advice to reduce workload and to rest**\n– Advise on danger signs\n– **Reassess at the next contact or in 1 week if 8 months pregnant** .....  
"description": "Existing chronic health conditions\" = \nHypertension\")\n OR ((140 mmHg  $\leq$  \nSystolic blood pressure\" < 160 mmHg)\n AND (140 mmHg  $\leq$  \nRepeat systolic blood pressure\" < 160 mmHg)\n AND (\nUrine dipstick result – protein\" = \"+\" AND .....

# FHIR IGs and how they are used for Clinical Reasoning

## FHIR Implementation Guidelines



A set of rules of how a particular interoperability or standards problem is solved - typically through the use of FHIR resources.

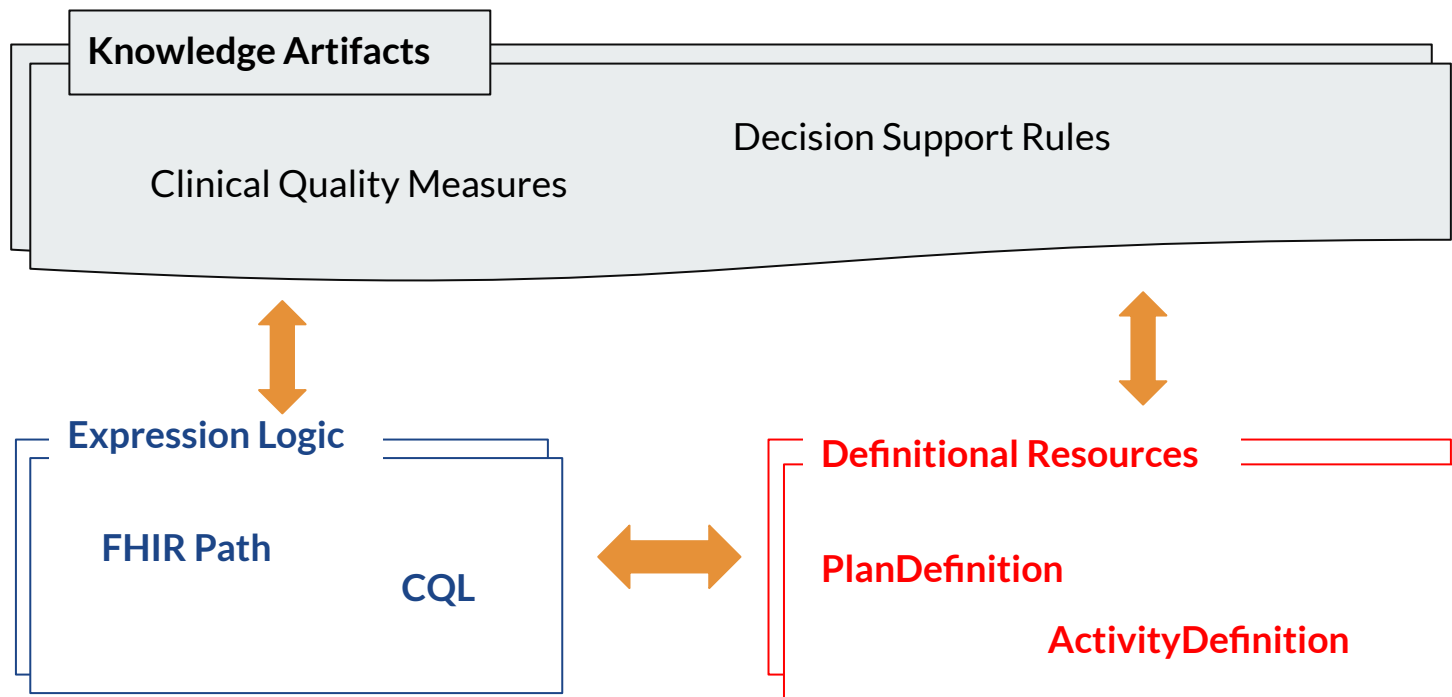
## Clinical Decision Support

CDS provides health workers, or patients with person-specific, intelligently filtered, and timely information to enhance health and health care.

## FHIR Clinical Reasoning Module

- Provides resources and operations to enable the representation, distribution, and evaluation of clinical knowledge artifacts such as clinical decision support rules and quality measures.
- Describes how expression languages can be used in FHIR to provide dynamic capabilities.

# FHIR Quality Reasoning Components





**OPENSERP**

**Lessons from ONA**



# Adoption needs more than an app

 **OPENSERP**

Web app for user, data and  
content management

Identity & Authz

OHS: Access Proxy

Admin Web App: FHIR Web

Web app synced with data  
store, integrations to national  
data systems, eg LMIS /  
DHIS2

Analytics

OHS: FHIR Analytics

Mobile Client: FHIR Core

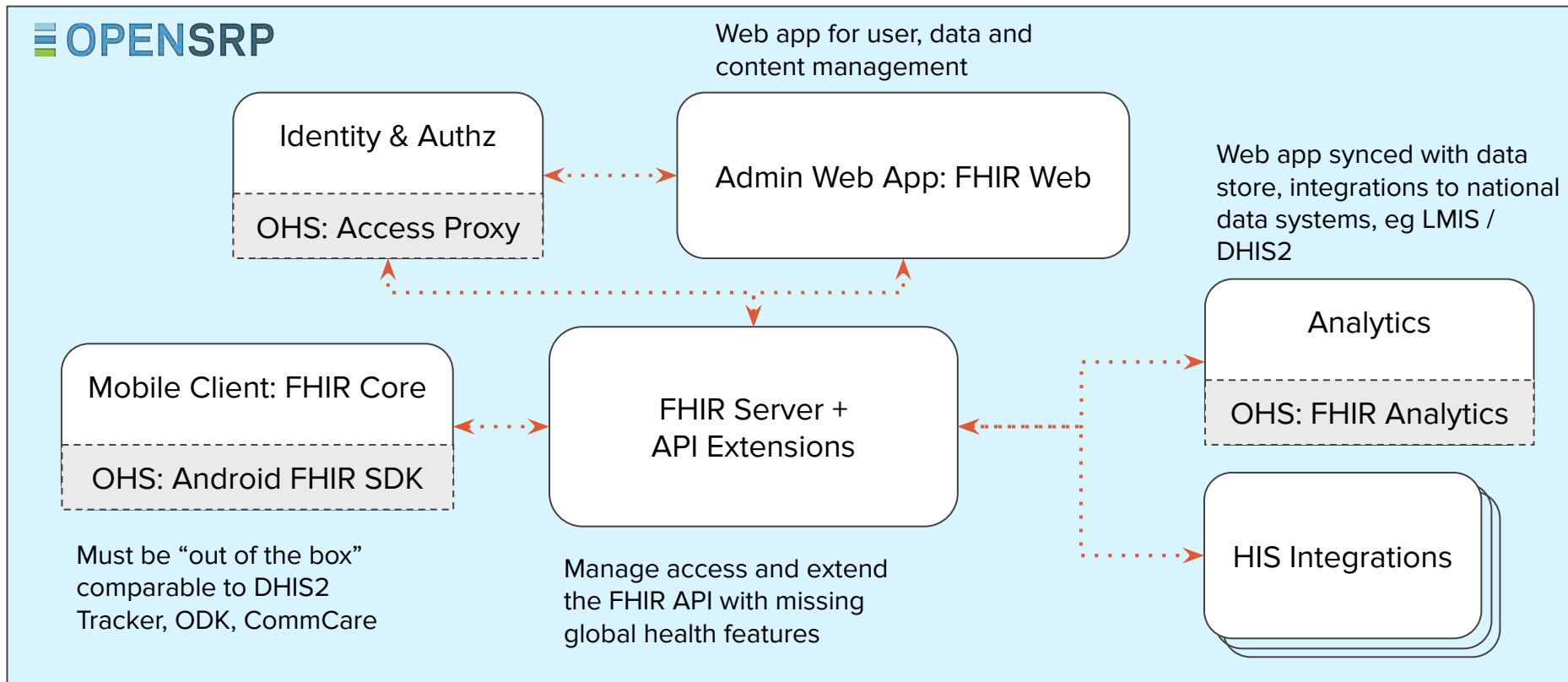
OHS: Android FHIR SDK

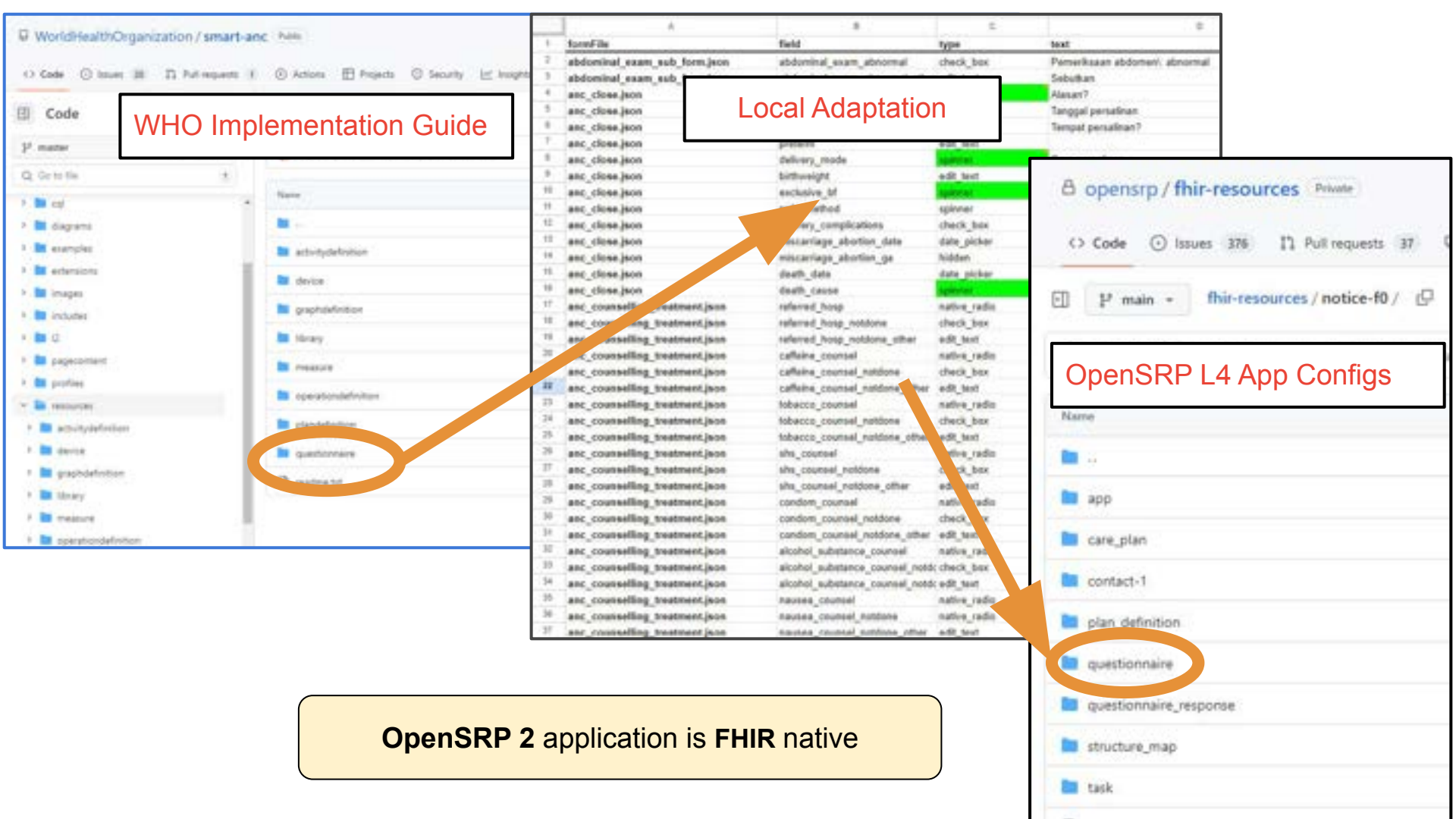
FHIR Server +  
API Extensions

HIS Integrations

Must be “out of the box”  
comparable to DHIS2  
Tracker, ODK, CommCare

Manage access and extend  
the FHIR API with missing  
global health features



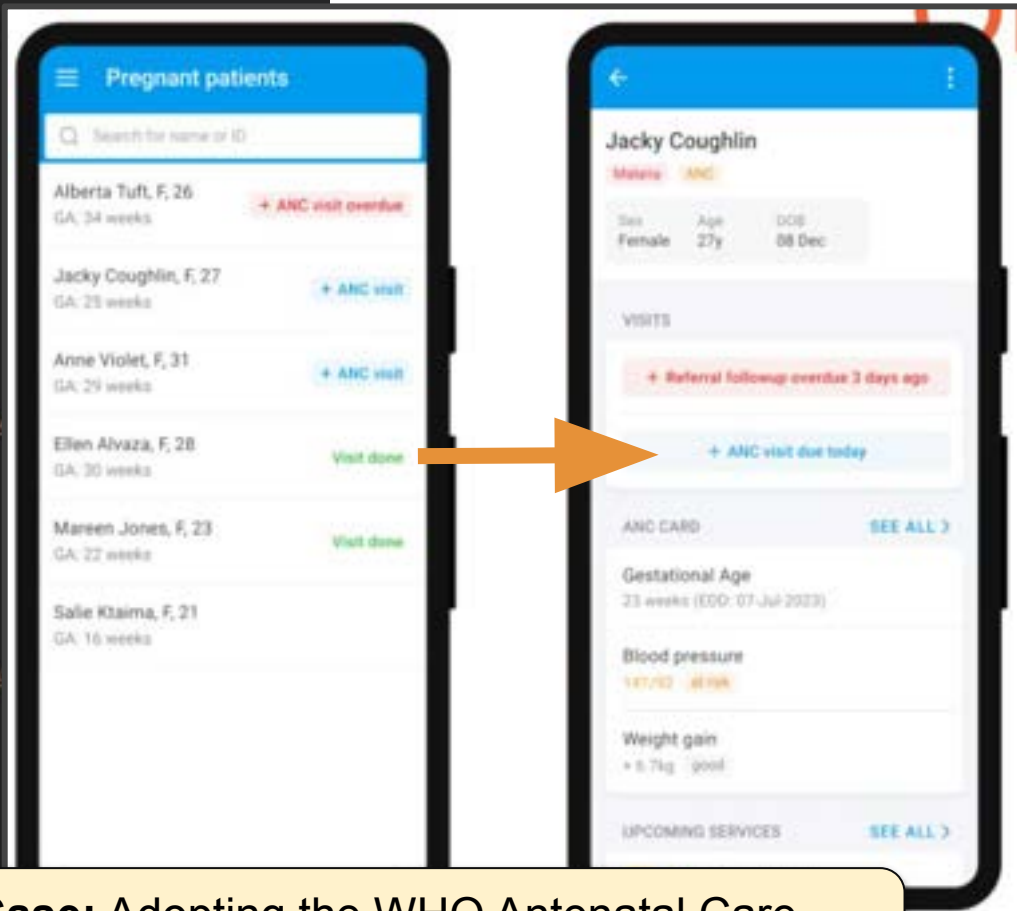




```
EXPLORER
  NOTICE-19
  app
  > profiles
  > registers
  (|) adult_register_config.json
  (|) anc_register_config.json
  (|) child_register_config.json
  (|) household_register_config.json
  > translations
  (|) application_config.json
  (|) composition_config.json
  (|) navigation_config.json
  (|) sync_config.json
  > care_plan
  > contact-1
  > plan_definition
  > questionnaire
  > questionnaire_response
  > structure_map
  > task

  anc_register_config.json X
  app > registers > (|) anc_register_config.json > ...
  1 {
  2   "appId": "notice-1",
  3   "configType": "register",
  4   "id": "ancRegister",
  5   "fhirResource": {
  6     "baseResource": {
  7       "resource": "Patient",
  8       "nestedSearchResources": [
  9         {
 10           "resourceType": "Condition",
 11           "referenceParam": "subject",
 12           "dataQueries": [
 13             {
 14               "paramName": "code",
 15               "filterCriteria": [
 16                 {
 17                   "dataType": "CODEABLECONCEPT",
 18                   "value": {
 19                     "system": "http://snomed.info/s",
 20                     "code": "77386000"
 21                   }
 22                 }
 23               ]
 24             }
 25           ],
 26           "paramName": "clinical-status",
 27           "filterCriteria": [
 28             {
 29               "dataType": "CODEABLECONCEPT",
 30               "value": {
 31                 "system": "http://terminology.h",
 32                 "code": "active"
 33               }
 34             }
 35           ]
 36         }
 37       ]
 38     },
 39     "sortConfigs": [
 40       {
 41         "paramName": "date",
 42         "dataType": "DATE",
 43         "order": "DESCENDING"
 44       }
 45     ]
 46   }
 47 }
```

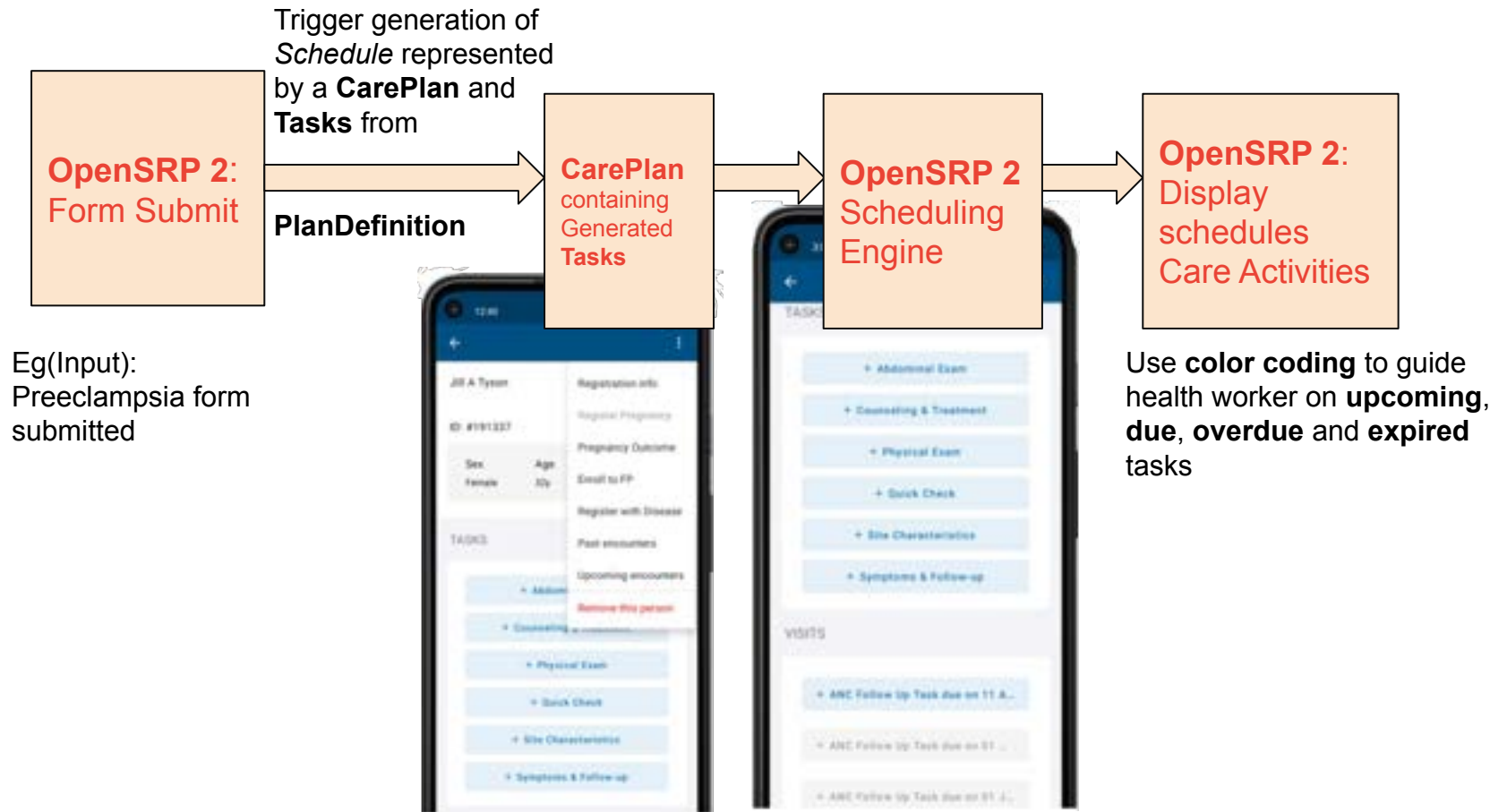
OpenSRP ANC App Configs



**Use Case:** Adopting the WHO Antenatal Care SMART Guidelines to Indonesia

# Care workflows

Through Scheduling and Tasking



# Clinical Reasoning

## *Through* Structured Data Capture

Enabled by SDC Expressions using FHIR Path

- **enableWhenExpression** supports skip logic
- **initialExpression** to initialize field values
- **answerExpression** to populate answer options from existing data
- **calculatedExpression** for dynamic calculation of answers to questions as other questions are answered

Anthropometric First Visit-en-GB

Components	
Group	1. Does the child have oedema?
Text answer	2. Child has oedema
Information text	2.1. What is the severity?
Attachment	2.2. The child should be referred to Stabilization Center. Confirm referral.
Recipient list	
Recipient component	3. Please enter child's MUAC in mm
Confirmation	
Choice	4. MUAC RED
Date	4.1. The child has Severe Acute Malnutrition. Confirm referral to Stabili...
Time	
Number	5. MUAC GREEN
Quantity	6. MUAC YELLOW
	6.1. Please select the admission type:
	6.2. Please select the entry care point:
	7. Please select a programme. Suggested programme: TSFP (MAM)
	8. Please select a programme. Suggested programme: TSFP (MAM)
	9. Please select a programme. Suggested programme: OTP (SAM)
	10. Please select a programme. Suggested programme: OTP (SAM)
	11. Please select a programme. Suggested programme: OTP (SAM)
	12. TSFP (MAM)
	12.1. Please select the admission criteria

12:30 SBIRT Session 1

On average, how many days per week do you drink alcohol?

☐ 0 days

☐ 1 day

☐ 2 days

☐ 3 days

☐ 4 days

☐ 5 days

☐ 6 days

☐ 7 days

BACK NEXT

12:30 SBIRT Session 1

How often do you have six or more drinks on one occasion?

☐ Never

☐ Less than monthly

☐ Monthly

☐ Weekly

☐ Daily or almost daily

BACK NEXT

Screening

12:30 SBIRT Session 1

Risk assessment

Alcohol risk: Severe

The patient has severe risk but none concern.

Alcohol consumption greatly exceeds health limits

Experiencing frequent and/or recent immediate consequence of drinking

Experiencing very frequent symptoms of addiction to alcohol

Risk Assessment

12:30 SBIRT session 1

Reasons to use

Health benefits, feel better

Consequences of use

Health harms

BACK NEXT

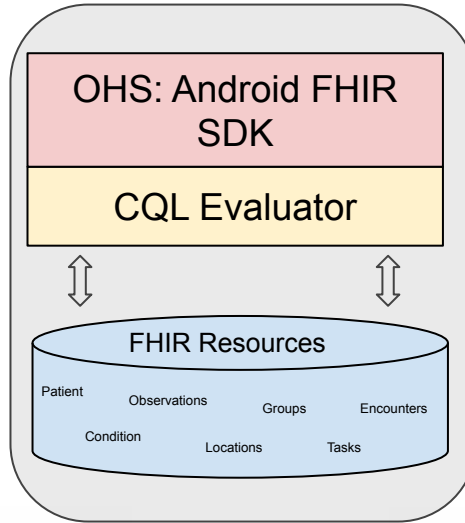
Brief Intervention

**Clinical Reasoning Use Case:** mental health interventions and management

# Quality Reporting



**Measures** are written in **CQL** and encoded and represented as **ELM Libraries**



**\$evaluate-measure**



**MeasureReports** are generated and stored on the device with data from them shown to the user

**Quality Measures (QMs)** are represented using the FHIR Clinical Reasoning Module in **Clinical Quality Language (CQL)**

**OpenSRP** using the **Android FHIR SDK** and **CQL Evaluator** libraries generates **Measure Reports** through the FHIR **\$evaluate-measure** operation



OpenMRS  
MEDICAL RECORD SYSTEM

# Lessons from OpenMRS



# Lesson from OpenMRS #1: SMART for Decision Support



# Approach

Build ability to handle SMART-style content

With tooling other GGs can use

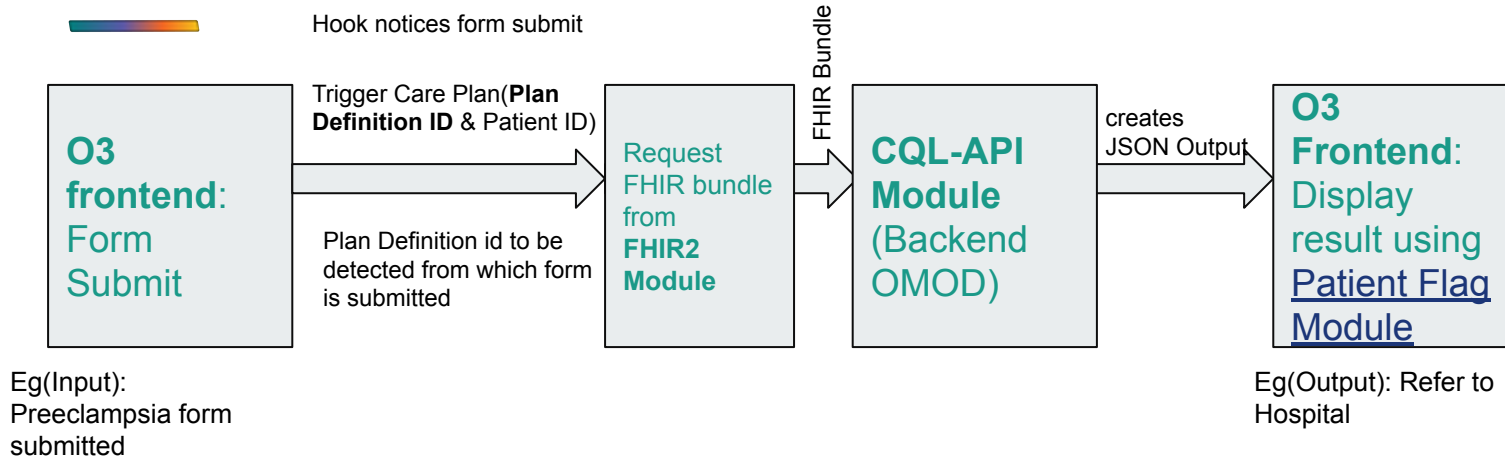
*Project: SMART Guideline Implementation: Implementing the ANC DAK in OpenMRS*

<https://wiki.openmrs.org/display/projects/SMART+Guideline+Implementation%3A+ANC+DAK>





# Basic Technical Workflow Diagram:



# 03: Display the results

Vitals

Date and time	BP (mmHg)	HR (b/min)	Pulse (beats/min)	SpO2 (%)	Temp (°C)
Tuesday, 17:14 AM	80 / 45	16	45	96	35
18 - Jan - 2023, 02:45 AM	---	---	---	---	---



Symptoms of Preeclampsia

ANC Preeclampsia

ANC Preeclampsia

Preeclampsia

Symptoms of severe preeclampsia

Discard

Save and close



TBC...

**Flags:**  
Must-Know vs  
Nice-to-Know  
flags

Triggers (non-linear  
workflows)

Alarm Fatigue

OpenMRS - SPA

Agnes Testerson - 40, Female

Attending clinical consultation

Adult HIV return visit

**Tasks:** Specific actions to be taken

**Task list**

- ☐ Order viral load test  
Last ordered: 12-Jan-2022  
Discussion
- ☐ Enroll patient in Venia program  
Last test: HIV1 negative  
No assignment
- ☐ Change regimen  
Reason: Reported high VL  
Discussion
- ☐ Enhanced adherence counseling  
Reason: High VL  
No assignment
- ☐ Refer for food exam  
Reason: Elevated HbA1c  
No assignment
- ☐ Refer to nutritionist  
Reason: Elevated HbA1c  
No assignment
- ☐ Update patient contact details  
No assignment
- ☐ Provide pill box  
No assignment
- ☐ Negotiate RTC date  
Reason:

**Vitals and biometrics** Tuesday, 14:56

Temp: 35.5°C

BP: 80/45 mmHg

Heart rate: 65 bpm

SpO2: 96%

Weight: 154 cm

Height: 60 kg

Weight: 25.3 kg/m²

**Patient summary**

High viral load

Not test too soon

Elevated HbA1c

HIV positive

Household equipment

Pregnant

Not fully disclosed

Syphilis allergy

**HIV status**

Last viral load: 2000  
Last CD4 count: 132  
Enrolled in care: 10-Jan-2006  
Current ARV regimen: Lamivudine, Tenofovir, Dolutegravir  
ARV initiation date: 09-Feb-2006  
Drug allergies: NSAIDs, Hepatitis  
SAC session: 2

**Tuberculosis**

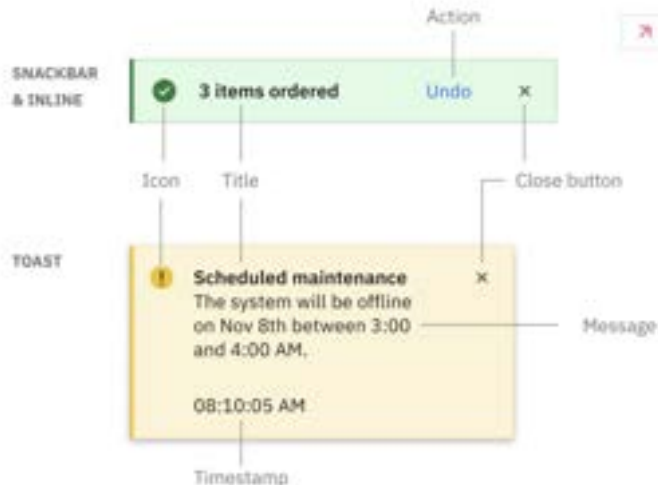
DOT prophylaxis start date: 23-Dec-2019  
DOT prophylaxis end date: 23-Dec-2019

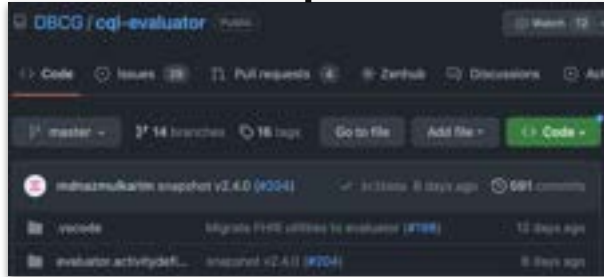
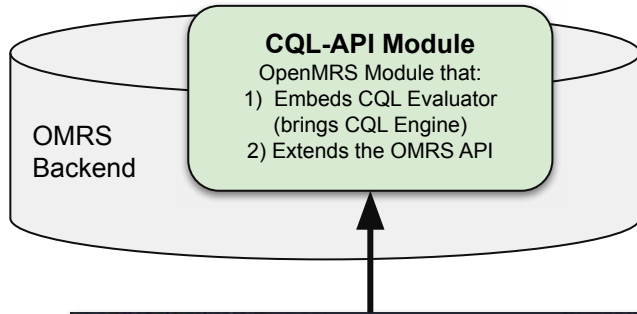
# UI Pattern Library

This section describes the main patterns which, combined, result in the OpenMRS 3.x User Interface.



Consistency

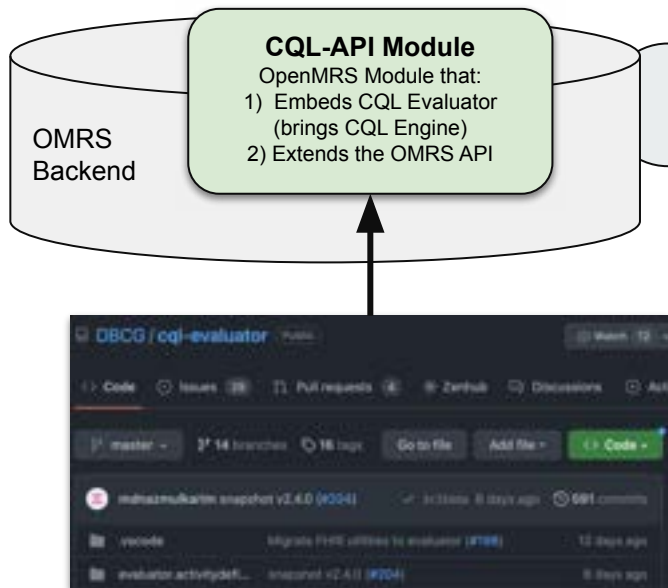




## Part 1: Created an OpenMRS Module, the “CQL-API Module”

- packages the CQL-Evaluator opensource project in an OpenMRS-friendly way
- Means OpenMRS can continue to leverage ongoing efforts in the CQL community / OSS project



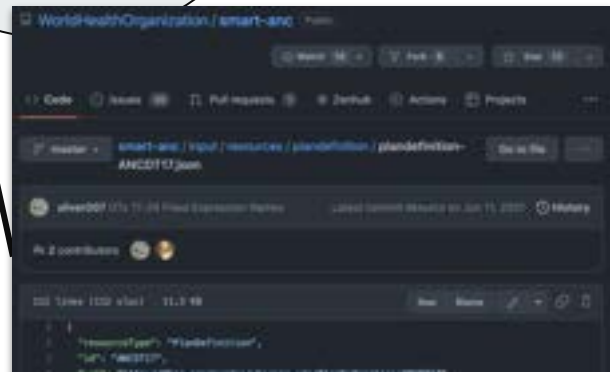
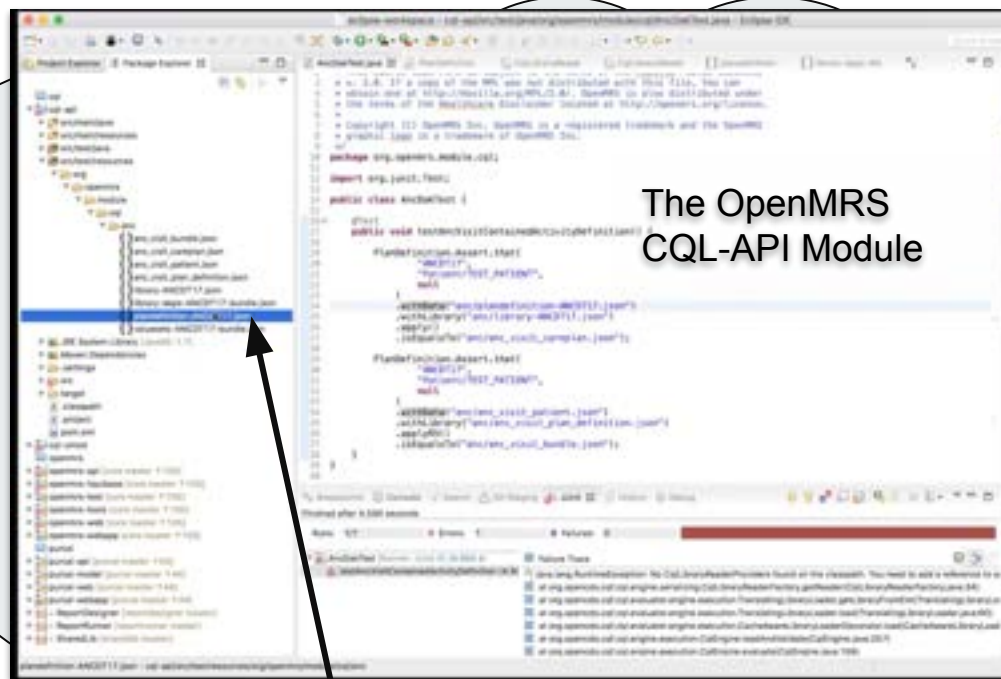


## Part 1: Created an OpenMRS Module, the “CQL-API Module”

- packages the CQL-Evaluator opensource project in an OpenMRS-friendly way
- Means OpenMRS can continue to leverage ongoing efforts in the CQL community / OSS project

## Part 2: Executing a prototype careplan

- Leveraging the ANC Preeclampsia careplan CQL available on GitHub
- Will use this to test and build on an end-to-end workflow (concepts → forms → run planDefinition → get careplan/decision support recommendation)





OCL



openmrs > 
 ANCDAK > 
 HEAD > 
 autoexpand-HEAD





Filters



<input type="checkbox"/>	Owner	Source	ID	From Concept	Type	To Concept
<input type="checkbox"/>	openmrs	ANCDK	36	FOUR plus CIEL > CIEL > 1362 One plus	SAME-AS	FOUR plus openmrs > ANCDK > ANC.B9.DE146 One plus
<input type="checkbox"/>	openmrs	ANCDK	37	CIEL > CIEL > 1363 Two plus	SAME-AS	openmrs > ANCDK > ANC.B9.DE147 Two plus
<input type="checkbox"/>	openmrs	ANCDK	38	CIEL > CIEL > 1364 Three plus	SAME-AS	openmrs > ANCDK > ANC.B9.DE148 Three plus
<input type="checkbox"/>	openmrs	ANCDK	39	CIEL > CIEL > 664 Negative	SAME-AS	openmrs > ANCDK > ANC.B9.DE145 None
<input type="checkbox"/>	openmrs	ANCDK	20	CIEL > CIEL > 147104 Blurred vision	NARROWER THAN	openmrs > ANCDK > ANC.B8.DE30 Visual disturbance
<input type="checkbox"/>	openmrs	ANCDK	26	CIEL > CIEL > 1107 None	BROADER THAN	openmrs > ANCDK > ANC.B8.DE28 No symptoms of severe pre-eclampsia
<input type="checkbox"/>	openmrs	ANCDK	32	CIEL > CIEL > 141128 Epigastric pain	SAME-AS	openmrs > ANCDK > ANC.B8.DE31 Epigastric pain
<input type="checkbox"/>	openmrs	ANCDK	31	CIEL > CIEL > 129251 Pre-eclampsia	SAME-AS	openmrs > ANCDK > ANC.B10.DE75 Pre-eclampsia
<input type="checkbox"/>	openmrs	ANCDK	30	CIEL > CIEL > 165205 Severe hypertension	SAME-AS	openmrs > ANCDK > ANC.B10.DE74 Severe hypertension
<input type="checkbox"/>	openmrs	ANCDK	29	CIEL > CIEL > 165280 Symptoms of severe pre-eclampsia	SAME-AS	openmrs > ANCDK > ANC.B8.DE27 Symptoms of severe pre-eclampsia



# Lesson from OpenMRS #2: SMART for Reporting Metrics







## Monitoring, Evaluation, and Reporting Indicator Reference Guide



MER 2.0 (Version 2.6.1)  
September 2022

### PREVENTION & SUPPORT INDICATORS

AGYW\_PREV  
FPINT\_SITE  
GENC\_OBV  
KP\_MAT  
KP\_PREV  
OVC\_SERV  
PP\_PREV  
PVEP\_CT  
PVEP\_NEW  
TB\_PREV  
VMMC\_CIRC

### TESTING INDICATORS

CKCA\_SCRN (including CKCA\_SCRN\_POS)  
HTS\_INDEX  
HTS\_RECENT  
HTS\_SELF  
HTS\_TST (including HTS\_TST\_POS)  
OVC\_HIVSTAT  
PMTCT\_EID  
PMTCT\_PO  
PMTCT\_HBI\_POS  
PMTCT\_STAT (including PMTCT\_STAT\_POS)  
TB\_STAT (including TB\_STAT\_POS)

### TREATMENT INDICATORS

CKCA\_TX  
PMTCT\_ART  
TB\_ART  
TX\_CURR  
TX\_ML  
TX\_NEW  
TX\_RTT  
TX\_TB

### VIRAL SUPPRESSION INDICATORS

TX\_PVL5

### HEALTH SYSTEMS INDICATORS

EMR\_SITE  
HRH\_PRE  
LAB\_PTDCP  
SC\_ARVDSIP  
SC\_CURR

### HOST COUNTRY INDICATORS

DIAGNOSED\_NAT  
TX\_CURR\_NAT  
VL\_SUPPRESSION\_NAT

### MONITORING SPECIAL INITIATIVES

DREAMS  
Faith and Community Initiative  
Mandisa  
Cervical Cancer Screening and Treatment

## TX\_CURR

<b>Description:</b>	Number of adults and children currently receiving antiretroviral therapy (ART)	
<b>Numerator:</b>	Number of adults and children currently receiving antiretroviral therapy (ART)	Count the number of adults and children who are currently receiving ART.
<b>Denominator:</b>	N/A	
<b>Indicator changes (MER 2.0 v2.6 to v2.6.1):</b>	None	
<b>Reporting level:</b>	Facility	
<b>Reporting frequency:</b>	Quarterly	
<b>How to use:</b>	<p>This indicator measures the ongoing scale-up and uptake of ART and continuity of treatment in ART programs as a critical step in the HIV service cascade and assesses progress towards coverage of ART for all eligible HIV-positive individuals when reviewed against the number of PLHIV that are estimated to be eligible for treatment. It allows us to track the response to the epidemic in specific geographic areas and among specific populations as well as at the national level. Disaggregations by age and sex can help better understand which populations are at epidemic control and which populations are lagging behind. Collection of expanded age data (50-54, 55-59, 60-64, and 65+) is needed for planning appropriate HIV services for older adults as well as integrated service needs. As the treatment cohort continues to age, the ability to monitor lifelong patient outcomes is critical. Finally, disaggregations on ARV dispensing quantity can be used to determine uptake of MMD at PEPFAR sites, in PEPFAR SNUs, and across PEPFAR partners.</p>	
<b>How to collect:</b>	<p>This indicator should be collected from facility ART registers/databases, program monitoring tools, and drug supply management systems.</p> <p>Count the number of adults and children who are currently receiving ART in accordance with the nationally approved treatment protocol (or WHO/UNAIDS standards) at the end of the reporting period. Importantly, <u>patients who have not received ARVs within four weeks (i.e., 28 days) of their last missed drug pick-up should not be counted.</u></p> <p><u>The following should also be considered:</u></p> <ul style="list-style-type: none"> <li>Patients on ART who initiated or transferred-in during the reporting period should be counted.</li> <li>Patients that pick up 3 or more months of anti-retroviral drugs at one visit (i.e., multi-month dispensation) should also be counted as long as they have received enough ARVs to last to the end of the reporting period at a minimum.</li> <li>However, if it is determined that a patient has died, they should immediately be removed from the TX_CURR results.</li> <li>HIV-positive pregnant women who are eligible for and are receiving antiretroviral drugs for their own treatment should be counted. HIV-positive pregnant women initiating lifelong ART through PMTCT (Option B+) will count as "current" on ART under this indicator. These include HIV-infected pregnant women who:               <ul style="list-style-type: none"> <li>Have newly initiated ART during the current pregnancy</li> <li>Are already on ART at the beginning of the current pregnancy</li> </ul> </li> </ul> <p>Patients excluded from the current on ART count are patients who died, stopped treatment, transferred out, or experienced interruption in treatment (IT). <u>Patients who have not received ARVs within four weeks (i.e., 28 days) of their last missed drug pick-up should not be counted.</u> Patients do not need to qualify as IT before tracing efforts commence. Efforts to trace patients that have missed a clinical visit or drug pick-up should begin immediately following a missed clinical contact.</p>	





Can SMART Tooling be used to reproducibly calculate a TX\_CURR value that is accurate compared to the current TX\_CURR calculated by a real-world implementation?

The screenshot shows a GitHub repository for PATH-Global-Health/MERIndicators. The file being viewed is TX\_CURR.cql, located in the input/cql directory. The file is 44 lines long and 1.13 KB in size. The code is a CQL query for calculating the current number of adults and children receiving antiretroviral therapy (ART). It includes comments in Portuguese and English, and uses the TXCURR library version 0.1.0, FHIR version 4.0.1, and FHIRHelpers version 4.0.1. The code is as follows:

```
1 // TX_CURR, WHO HIV.DGJ.V.1
2 // numerator only
3 // Number of adults and children currently receiving antiretroviral therapy (ART)
4 // Sum of age/sex disaggregates
5
6
7 library TXCURR version '0.1.0'
8
9 using FHIR version '4.0.1'
10
11 include FHIRHelpers version '4.0.1'
12 include FHIRCommon version '4.0.1' called FC
13
14 include DASHConcepts called Cx
```





OCL

Search OCL



SIGN IN

PEPFAR

DASH-Test2

HEAD

TX\_CURR

Actions

## Personal-Level Monitoring & Evaluation

Public

Personal-Level Monitoring & Evaluation

Supported Locales: en

AutoID Mapping ID: sequential

Last updated on 04/27/2021 by datim-admin Created on 04/27/2021 by datim-admin

Concepts

Mappings

Versions

Summary<sup>beta</sup>

Search Personal-Level Monitoring & Evaluation concepts...



Filters

Numerical ID

Share

ID	Display Name	Class	Datatype
<input type="checkbox"/> 78911_TXPVLS	TXPVLS [en]	Fhir_measure	Numeric
<input type="checkbox"/> 67894_HIV_STATUS	HIV_status [en]	Fhir_category	Numeric
<input type="checkbox"/> 67893_Test_Indication	Test_Indication [en]	Fhir_category	Numeric
<input type="checkbox"/> 67892_SEX	Sex [en]	Fhir_category	Numeric
<input type="checkbox"/> 67891_AGE_GROUP	Age_group [en]	Fhir_category	Numeric
<input type="checkbox"/> 12391_UNDOCUMENTED_TE...	Undocumented_Test_Indication [en]	Fhir_Disag	Numeric
<input type="checkbox"/> 12381_HIV_POSITIVE	Positive [en]	Fhir_Disag	Numeric
<input type="checkbox"/> 12373_UNKNOWN_SEX	unknown_sex_TBD [en]	Fhir_Disag	Numeric
<input type="checkbox"/> 12372_M	M [en]	Fhir_Disag	Numeric
<input type="checkbox"/> 12371_F	F [en]	Fhir_Disag	Numeric

## TX\_CURR Treatment Currently on ART Indicator

Class: Reference Indicator Datatype: None

Created on 04/27/2021 by datim-admin

Last updated on 04/27/2021 by datim-admin

PEPFAR Support Definition	Standard definition of DSD and TA-SDI used.
Reporting Frequency	Quarterly
Reporting Level	Facility

### Associations 2

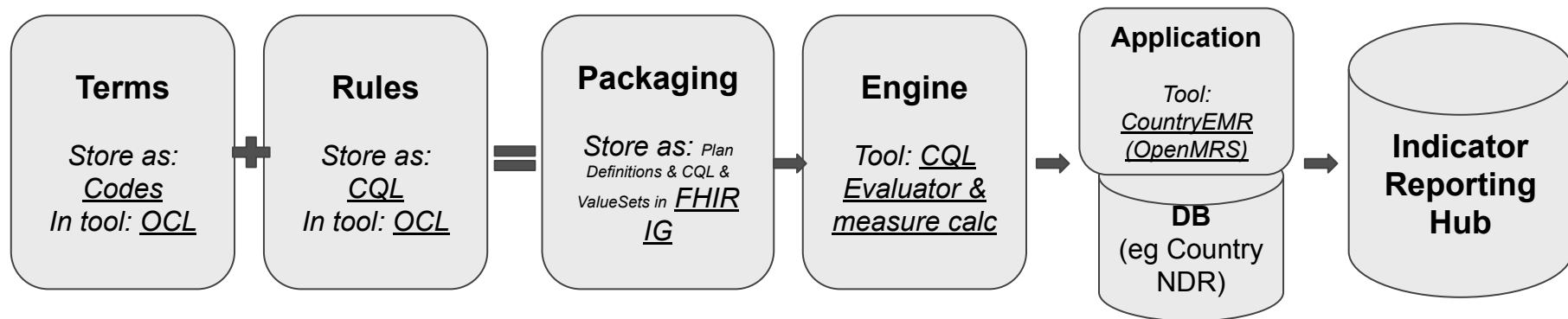
Include Retired

Relationship	Code	Name	Source
Has Data Element	TX_CURR_N_PLM_Age_Sex_HIVStatus	TX_CURR (N, PLM, Age/Sex/HIVStatus): Receiving ART	DA Te
	TX_CURR_DEMO_N_PLM_Age_Sex_HIVStatus	TX_CURR_DEMO (N, PLM, Age/Sex/HIVStatus): Receiving ART	

### Collection Membership 2



## Pipeline & Pieces Diagram for SMART MER TX\_CURR



# Implementation Challenges



# Gaps to creating impact with the SMART Guidelines



- **Usage of in-line CQL Scripts:**
  - No clear mechanism can trigger in-CQL is provided via text/CQL-identifier
- **Data extraction**
  - Data extraction processes/specifications are not provided
  - Limited references to which SNOMED or LOINC codes to use to define the desired concepts for extracted resources
- **Performance of the CQL Engine**
  - Enhance speed of real-time decision support calculations; testing report indicator calculation with large data sets
- **Usage of value sets**
  - Potential knowledge gap in connecting with appropriate value set terminology server to provide drop-down options for input spinners
  - New project: Fuzzy Matching to make terminology mapping easier (*next slides*)



## Mapping Decision Support Tool

### Select your Source or Collection

(This should be one **owned by** you or your organization. You can only create mappings to things you have privileges for.)

MyVersionofMRS

V

### Select the Reference Source or Collection

(Something you might not own but you want to map to, such as CIEL, ICD, LOINC, etc.)

WHO ANC SMART Codes

V

Check for Matches



## Mapping Decision Support Tool

### MyVersionofMRS

Public

Concept Dictionary for MyVersionofMRS

Short Code: MVMRS

Name: MyVersionMRS

Collection type: Dictionary

Custom Validation Schema: OpenMRS

Supported Locales: en

400  
possible  
matches  
found!

### WHO ANC SMART Codes

Public

Concept Dictionary for OHRI Care and Treatment

Short Code: OCT

Name: OHRI Care and Treatment

Collection Type: Dictionary

Custom Validation Schema: OpenMRS

Supported Locales: en

Decision to map is **still human mediated**

External ID	27	111759AAAAAAAAAAAAAAAAAAAAAAAAAAAA
Name	HEPATITIS B	Hepatitis B
Names & Synonyms	Fully Specified [en]: HEPATITIS B Fully Specified [es]: Hepatitis viral tipo B	Fully Specified [en]: Hepatitis B Fully Specified [es]: hepatitis viral tipo B Fully Specified [fr]: Hépatite B Fully Specified [nl]: type B virale hepatitis Fully Specified [vi]: Viêm gan B Fully Specified [vi]: Viêm gan siêu vi B
Class	Diagnosis	Diagnosis
Datatype	N/A	N/A
Display Locale	en	en es fr nl vi
Description	Liver infection with hepatitis B	
Mappings		Q-AND-A-1 HIV related opportunistic infections - Source: OCT

More fields V

Map from "HEPATITIS B" to "Hepatitis B" as

BROADER-THAN  
NARROWER-THAN  
SAME-AS

CREATE MAPPING





## Next Steps:

- 1) Make Mapping easier
- 2) Better support the Rule Engine ecosystem
- 3) SMART IGs are only as effective as the available L4 tools & platforms. How can we collaborate?



*Thank you!*

**Q & A**



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