Digital modeling of Primary Child Health. A case study in health informatics

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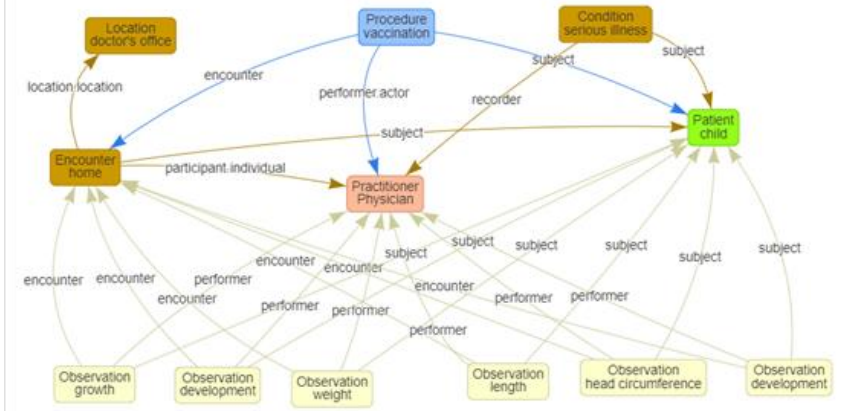[1] *Postgraduate Institute of Medicine, University of Colombo, Sri Lanka*
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- **Background:** The Pocket book of primary health care for children and adolescents is a guide for health promotion, disease prevention, and management from birth to adolescence. It contains important information on vaccinations, growth, and development, and is used by primary care doctors, nurses, and other health workers. The home-based record, recommended by WHO, records the history of health services received by an individual and is kept by the individual or caregiver in paper or electronic format. These two systems contain overlapping data. Identifying and harmonizing the data in an interoperable digital format will improve accuracy, efficiency and safety of primary child health care.

- **Objective:** The objective is to develop a digital model that can integrate the data collected by health professionals with those recorded in the home-based record in order to improve the quality of care and health outcomes for children and adolescents.

- **Methods:** First the study identified the data points collected by both systems using a case study of a 18 month-old patient diagnosed with Shwachman-Diamond Syndrome. Then the data points were coded using standard coding system and common data points were recognized. Finally, a Fast Healthcare Interoperability Resources (FHIR) architecture was developed to share the data between the two systems.

- **Results:** The study identified eight data points that are common to both systems. These could be coded using four coding systems: ICD, ICF, LOINC and ATC.

  [Table 1]

Data	Coding	Example
Serious illnesses since last check-up	ICD 10	Bacterial pneumonia: J15
Care situation & exceptional burdens in family	ICF	Looking after one's health d570
Abnormal stools	LOINC	Fat [Presence] in Stool: 2270-7
Weight	LOINC	Body weight Measured: 3141-9
Length	LOINC	Body height Measured: 3137-7
Head Circumference	LOINC	Head Occipital-frontal circumference: 9843-4
Development	ICF	Walking short distances: d4500
Growth	LOINC	Failure to thrive - 42819-3
	ICD 10	Failure to thrive (in child): R62.8
Vaccination	ATC	J07AL52 - Pneumococcus Purified Polysaccharides Antigen & Haemophilus Influenzae, Conjugated

ICD - International Statistical Classification of Diseases), ICF - International Classification of Functioning, Disability and Health, LOINC - Logical Observation Identifiers Names and Code, ATC - Anatomical Therapeutic Chemical Classification System

Data exchange primary care to home-based record with HL7/FHIR

Conclusion: A digital model integrating data from health professionals and home-based records improves care and health outcomes for children and adolescents. Utilizing standard coding and Fast Healthcare Interoperability Resources architecture allows for seamless sharing of information between systems, leading to more efficient and accurate data collection for better informed healthcare decisions for children and adolescents.

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