GEVITY

Fatal Flaws: *Introducing Risk by Substituting EMRs for Public Health Information Systems*

eHealth 2015

Margie Kennedy, PhD, RN, CPHIMS-CA, PMP, P2P
Maureen Perrin, MSc, CPHIMS-CA, CAPM

Informatics for a healthier world

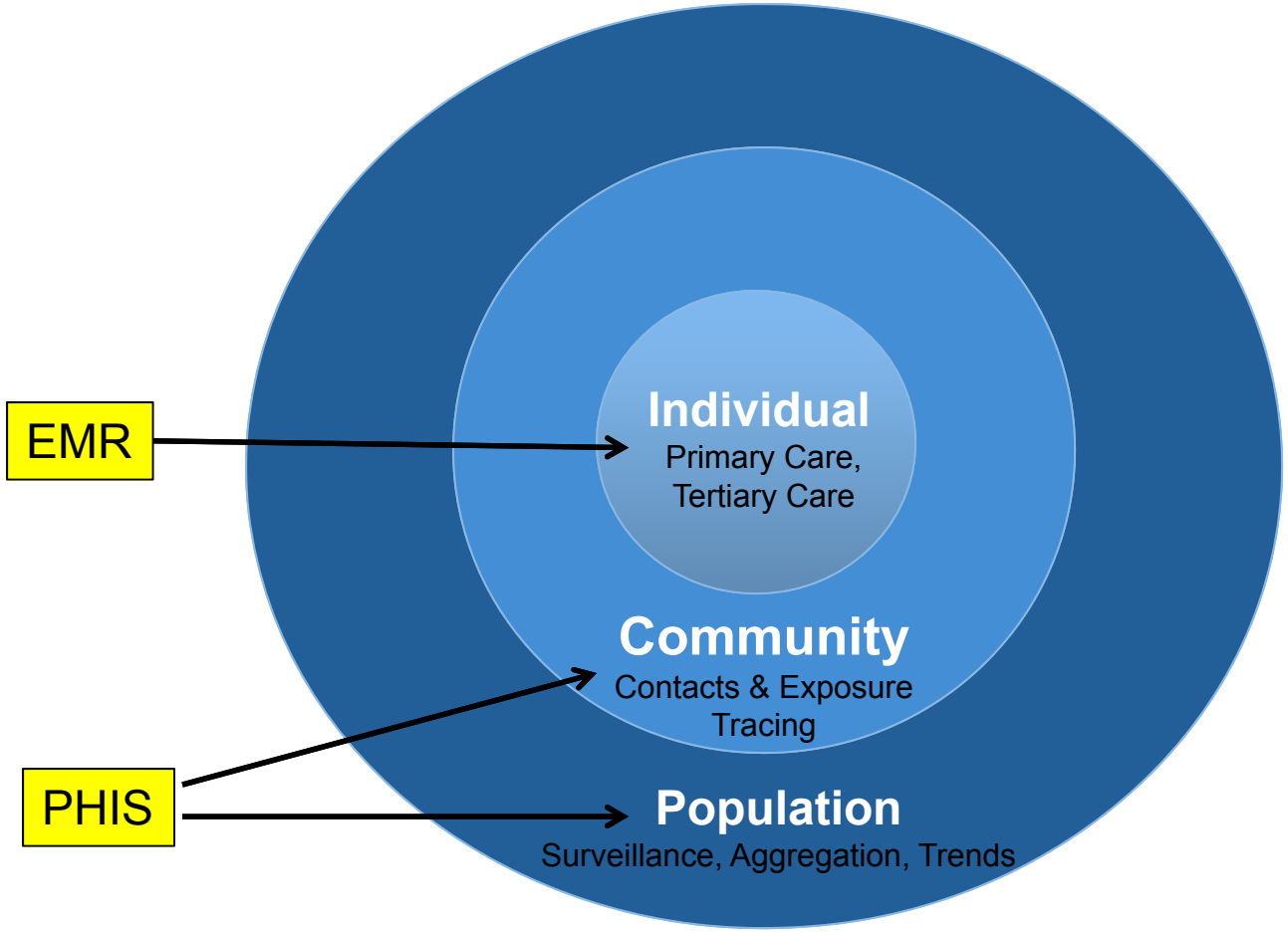
Objectives

GEVITY

1. Distinguish between Electronic Medical Records (EMRs) and Public Health Information Systems (PHIS)
2. Define the types of information requirements and outputs generated from EMRs and PHIS
3. Explore the impact of using EMR solutions as fully functional PHIS
4. Present recommendations for pragmatically assessing public health solution requirements

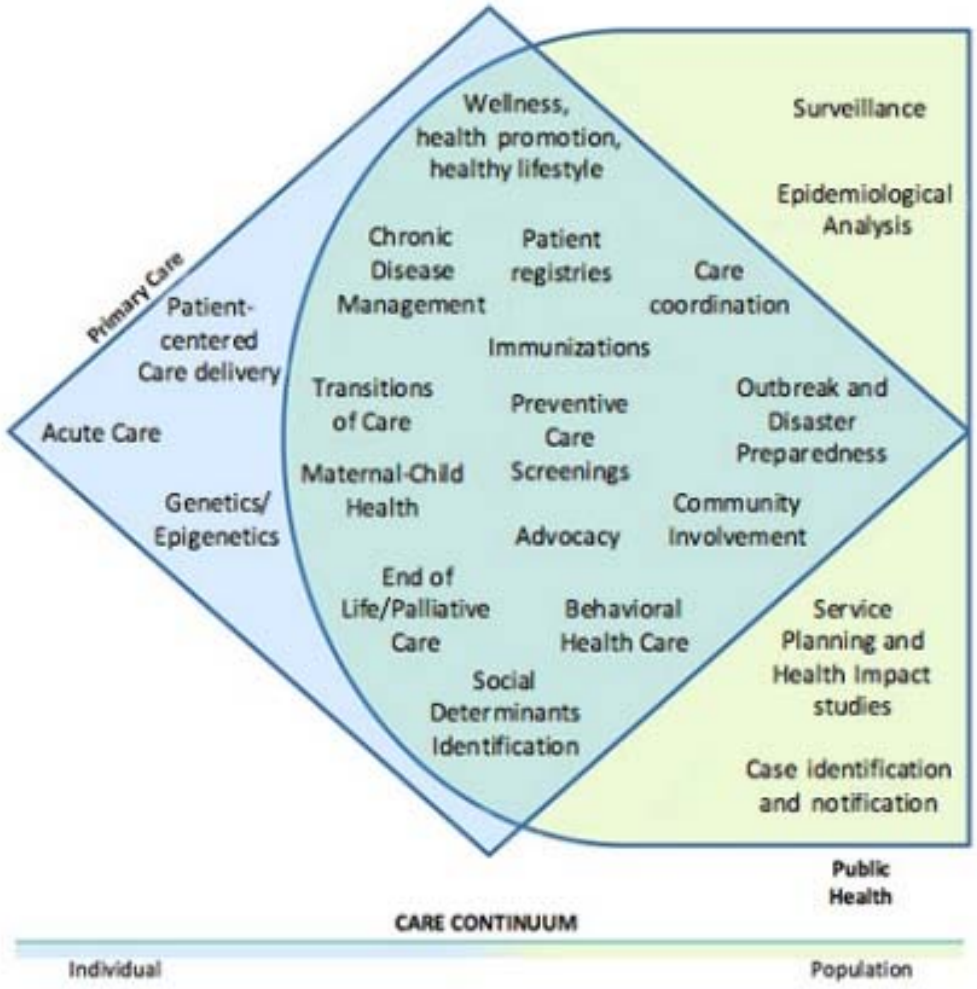
Healthcare System

GEVITY



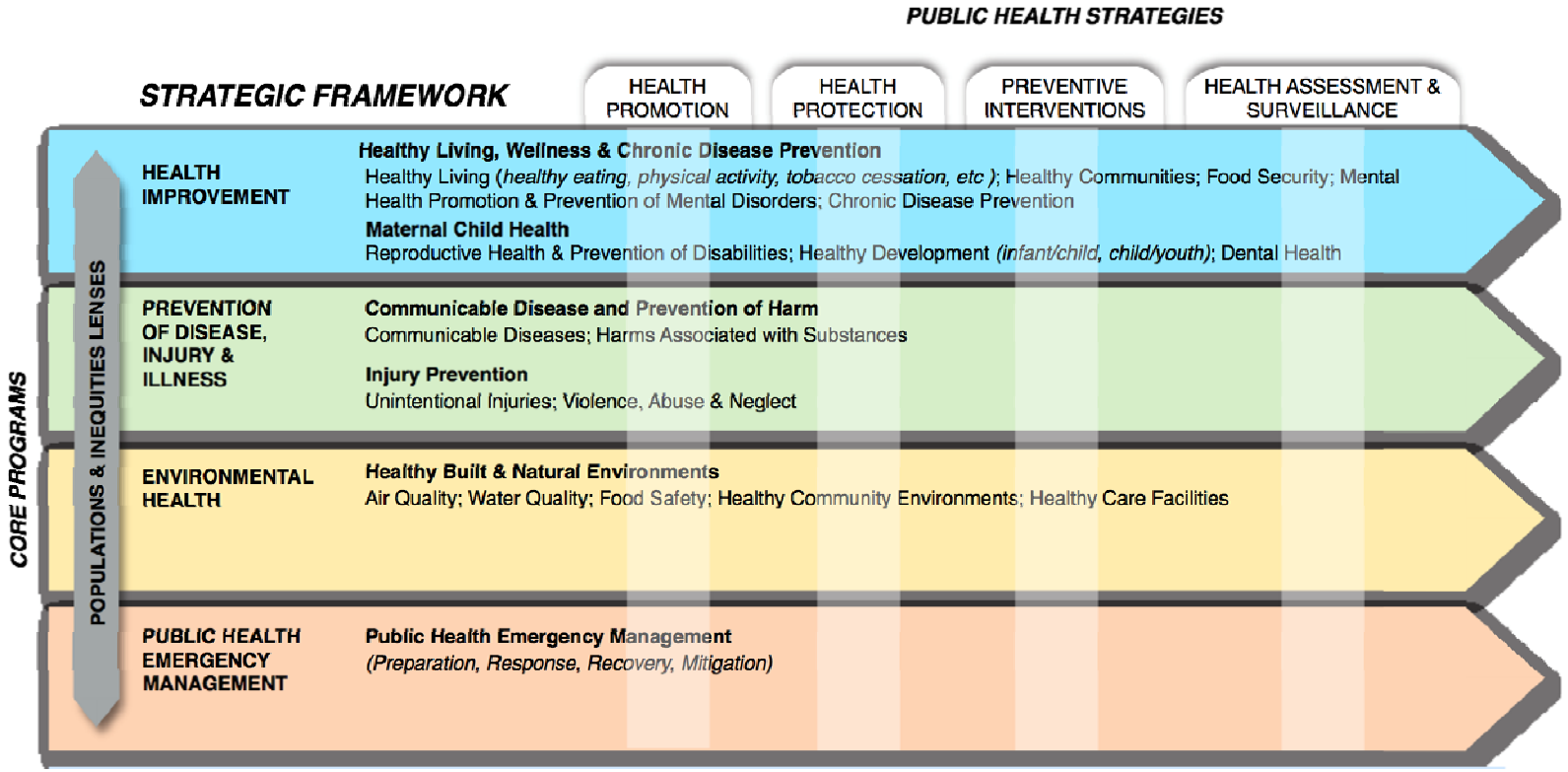
Blurring Lines

GEVITY



Informatics for a healthier world

What is public health?



Our public health focus: communicable disease and immunization

Source: http://www.health.gov.bc.ca/library/publications/year/2013/BC-guiding-framework-for-public-health.pdf

Informing the Debate

GEVITY

- Qualitative comparative analysis of current literature
- Online survey

GEVITY

DISTINGUISHING BETWEEN EMRS AND PHIS

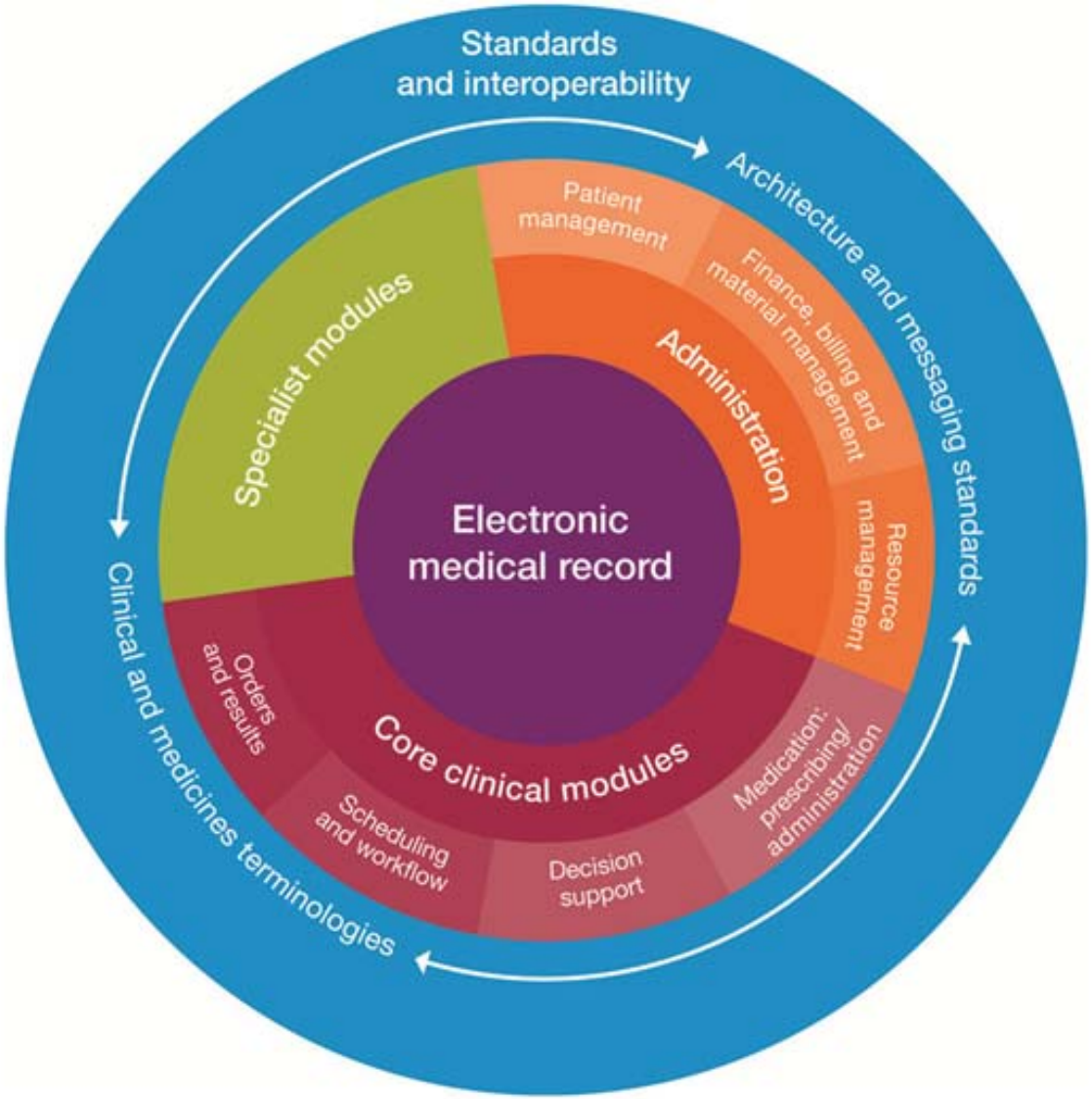
Electronic Medical Record

GEVITY

- Record for a single individual at the point of care
- Characterized by problem identification, patient/provider-level data and decision support
- Reflective of individuals *seeking* care
- Value for improving outcomes, improving access to data, and reducing error
- Primary care setting
  - Physician office
  - Nurse led clinics

Electronic Medical Record

GEVITY



Doyle, 2013

healthier world

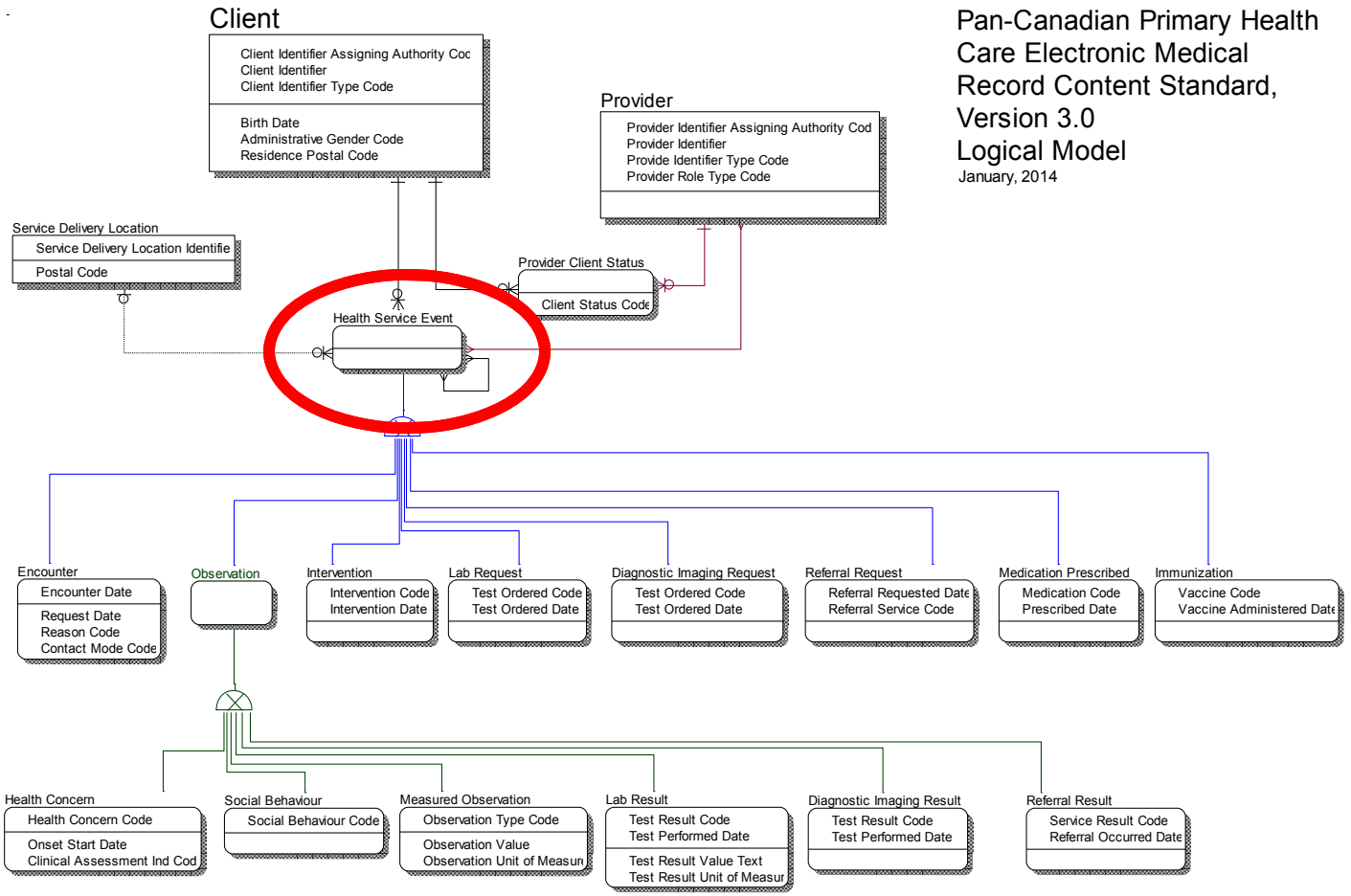
Typical EMR Functionality (Kukafka et al, 2007)

GEVITY

- Identify and maintain patient record
- Manage patient demographics
- Manage problem list
- Manage medication list
- Manage allergy and adverse reaction list
- Manage patient history
- Summarize health record
- Manage clinical documents and notes
- Capture external clinical documents
- Generate and record patient-specific instructions
- Order medications
- Order diagnostic tests
- Manage order sets
- Manage results
- Manage consents and authorizations
- Manage patient advance directives
- Support for standard care plans, guidelines, and protocols
- Capture variances from standard care plans, guidelines and protocols
- Support for drug interactions

EMR: Logical Model

GEVITY



Pan-Canadian Primary Health Care Electronic Medical Record Content Standard, Version 3.0
Logical Model
January, 2014

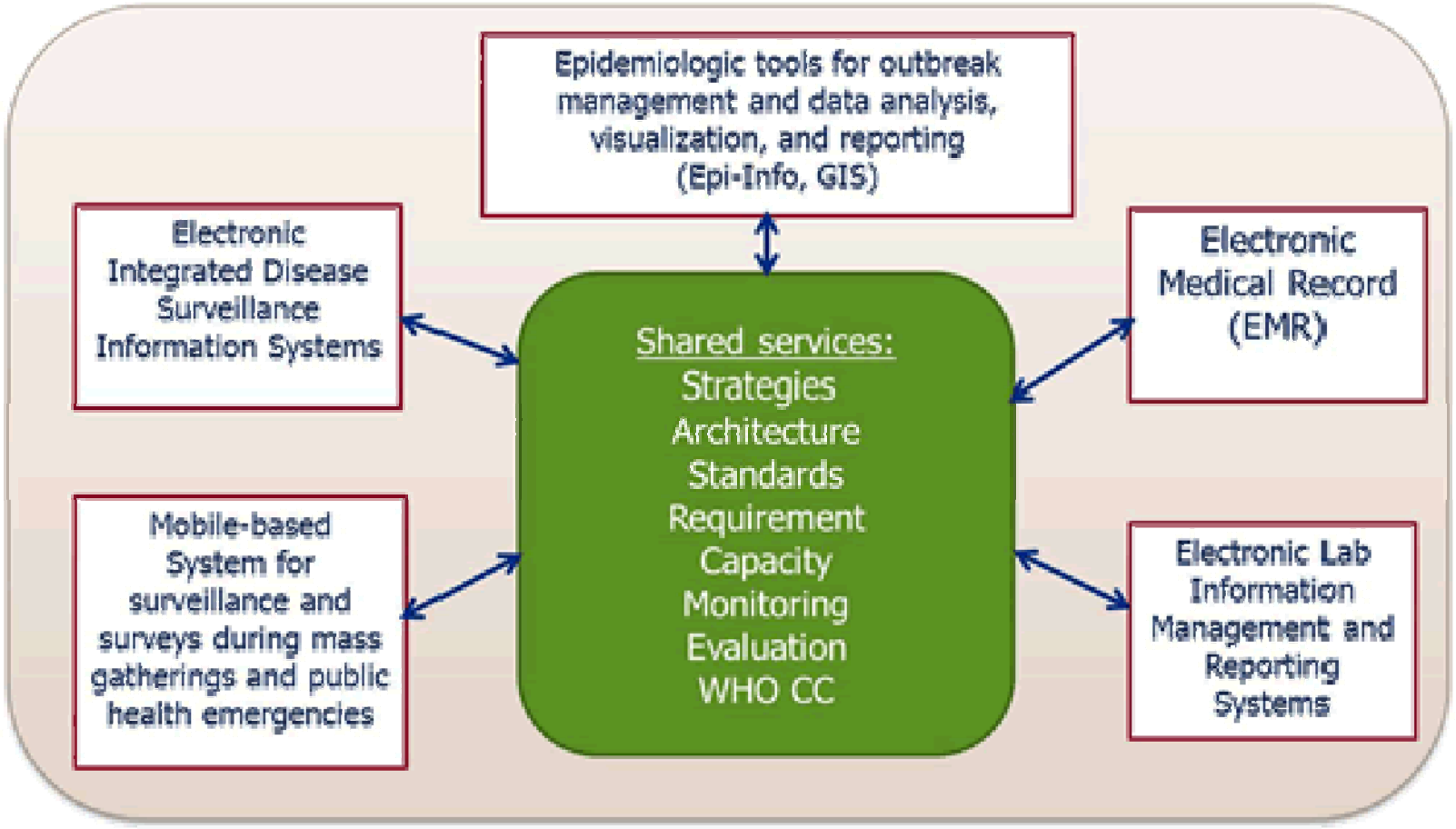
Public Health Information System

GEVITY

- Focus is on prevention, protection, promotion at population level
- Define ‘population’ based on geography or other demographic factors (e.g. gender, race, age, disease status)
- Used by public health
- Monitor trends and detect events
- Includes contacts (non-cases) and non-humans
- Manage of cohorts during outbreaks
- Focus on reporting for action

Public Health Information System

GEVITY



Source: http://www.cdc.gov/globalhealth/healthprotection/ghsb/gphi/what/index.htm

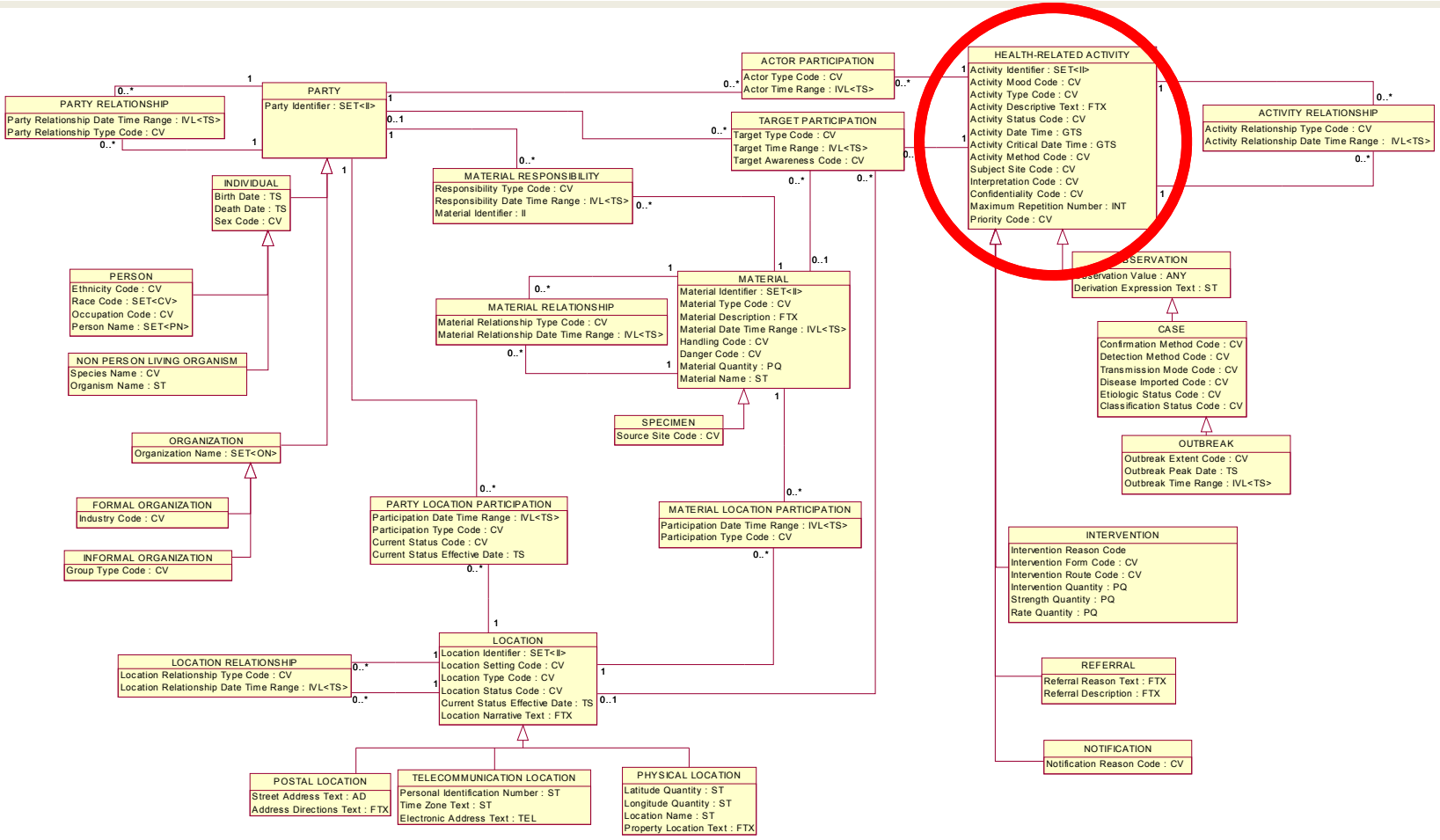
Typical PHIS CD Functionality

GEVITY

- Condition Reporting
- Event Identification and Validation
- Case Investigation
- Contact Tracing
- Case/Contact Specific Intervention
- Event/ Outbreak Management
- Public Health Alerts

Source: Public Health Informatics Institute. (2013). Electronic Disease Surveillance System (EDSS) Vendor Analysis,. Decatur, GA: Public Health Informatics Institute

PHIS: Logical Model



Source: https://www.hl7.org/documentcenter/public_temp_BBEFE940-1C23-BA17-0C16F9E56B61452F/wg/govsig/PHCDM%20NOW.ppt

Distinctions between EMR and PHIS

GEVITY

EMR

- **Purpose**
  - Support primary care, health delivery service
    - Family physician
    - Nurse-led clinics
- **Scope**
  - Treating illness of an individual
- **Functionality**
  - Clinical Assessment
  - Diagnostics (Labs, DI, etc.)
  - Pharmacological interventions
    - Limited or ongoing medication
  - Treatments (Physio, OT, other regimens)
  - Follow up
- **Key outcomes:**
  - Administrative (scheduling, billing, etc.)
  - Clinical management
  - Referrals/specialist

PHIS

- **Purpose**
  - Support health prevention/control and promotion at population level
    - Clinical
    - Surveillance
- **Scope**
  - Monitoring, detection, prevention in a population
- **Functionality:**
  - Managing immunizations
  - Identifying, investigating and managing cases and contacts of communicable disease
  - Supporting surveillance, investigation, monitoring, management, analysis and reporting of communicable disease outbreaks
  - Notifying public health professionals so information about critical events and emergencies can be shared quickly
  - Managing public health work processes
- **Key outcomes:**
  - Reporting
  - Health system response
  - Targeted health interventions
  - Policy and regulation development

Temptation to Substitute EMR for a PHIS

GEVITY

- Potential to 'stretch' functionality in the presence of fiscal constraint
  - Can't afford both EMR & PHIS
  - 'McGyver' an expanded functionality
- Higher expectations for collaboration between sectors
- Promise of real time bio-surveillance
- EMR can document immunizations
- Unstructured notes allows for inclusion of data not included in typical EMR scope
- Assumptions that data is easily interoperable and useful for public health
- Seduced by the promise of big data
  - Can embed algorithms to monitor trends

At what cost?
INTRODUCING RISK

Zinszer et al., 2013; Reeder et al., 2013; Klompas et al., 2012

Introducing Risk Through Substitution

GEVITY

- Critical Gaps
  - EMR focus is illness based vs PHIS focus on health & prevention
  - Different EHR models between vendors
  - Often do not include psychosocial, psychological, behavioral, or environmental factors relevant to public health (Vodel, 2014; Tomines et al, 2013)
  - Surveillance in EMRs is largely on chronic diseases (diabetes, etc.)
  - Only touch those individuals that seek medical care
  - Historical reluctance to share data
  - Data quality
    - Limited by standards, consistency in codification, GIGO, limited to geographical area (Vodel, 2014; French, 2014)
    - May be fragmented among variable providers
    - Data may be "too noisy and poorly controlled" for aggregation purposes (Kakafka et al, 2007)
    - Potential for double counting if recorded by multiple providers
  - Surveillance bias & Overdiagnosis (Eur Jnl of Public Health, 2013)

GEVITY

THE CANADIAN EXPERIENCE

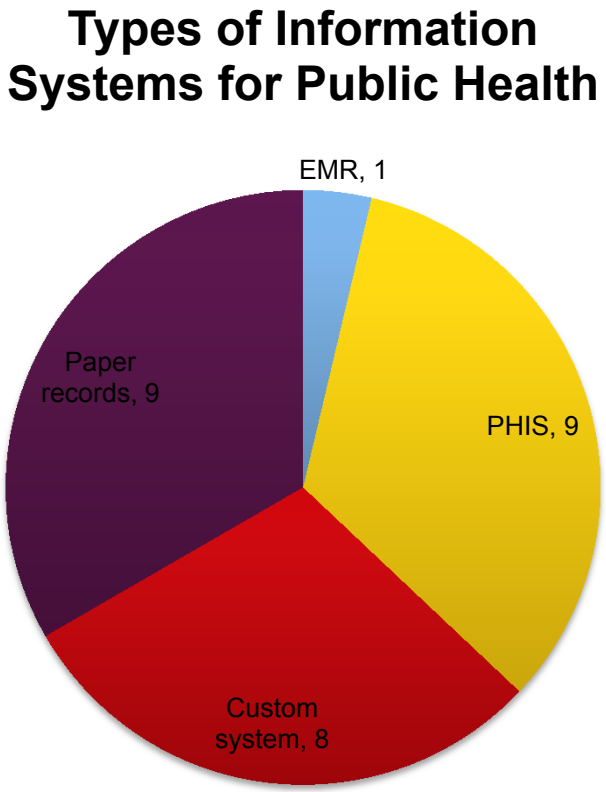
Characteristics of Respondents

GEVITY

- 14 completed surveys representing 9/13 jurisdictions
  - 46% represented provincial public health
- Composition
  - Managers
  - Nurses
  - Physicians
- Over half of respondents have more than 11 years of experience in public health

Survey Responses

GEVITY



- Hybrid environment implies transition
- Gaps in PHIS experience by 40% of respondents

GEVITY

RECOMMENDATIONS

Our Collective Obligation

GEVITY

- Era of increased complexity of disease and care and global population health crises
- Ensure that the core requirements of healthcare delivery and prevention/promotion are supported with appropriate resources
  - prepared HCP, and
  - the required information management tools to deliver care and prevention to the Canadian population.

Conclusions

GEVITY

- Lines are increasingly blurred between community-based care and public health
  - Where and how does it make sense to align from an informatics perspective?
- The architectural and logic models informing both EMRs and PHIS are fundamentally unique
  - Lack interoperability and comprehensive overlap
- The opportunistic use of EMRs as a substitute for a fully functional electronic public health information management solution is at it core, an unacceptable risk inducing attempt to cost save at the peril of our populations

A Path Forward

GEVITY

- Make decisions being *fully* informed of the distinction in scope and functionality between EMRs and PHIS
- Need policies to:
  - guide development of systems that share defined data with PH (Zinszer et al, 2013)
  - Reuse current data and capture new relevant data (Kukafka et al, 2007)
- Enable EMRs to generate automated extracts with algorithms sensitive to public health to flag relevant cases
  - Klompas et al, 2012; Zheng et al, 2014, Vogel, 2014

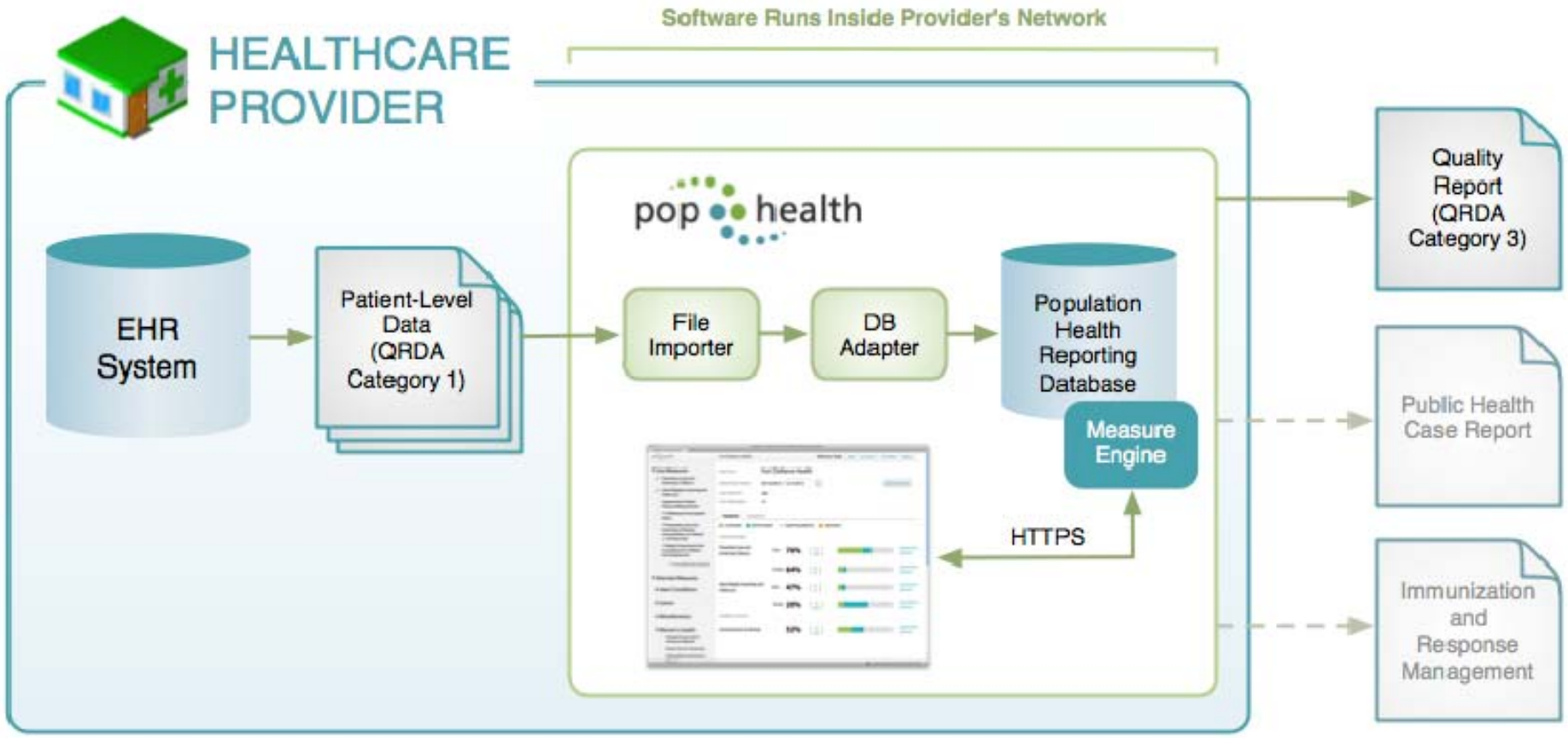
Other Options

GEVITY

- Public Health Surveillance and Informatics Program Office (PHSIPO) by CDC as a centralized point of leadership
- MDPHnet
  - Created by Harvard
  - Distributed network to share data from EMR
    - PopMedNet
    - ESPnet
  - Voluntary subscription

Art of the Possible

GEVITY



Informatics for a healthier world

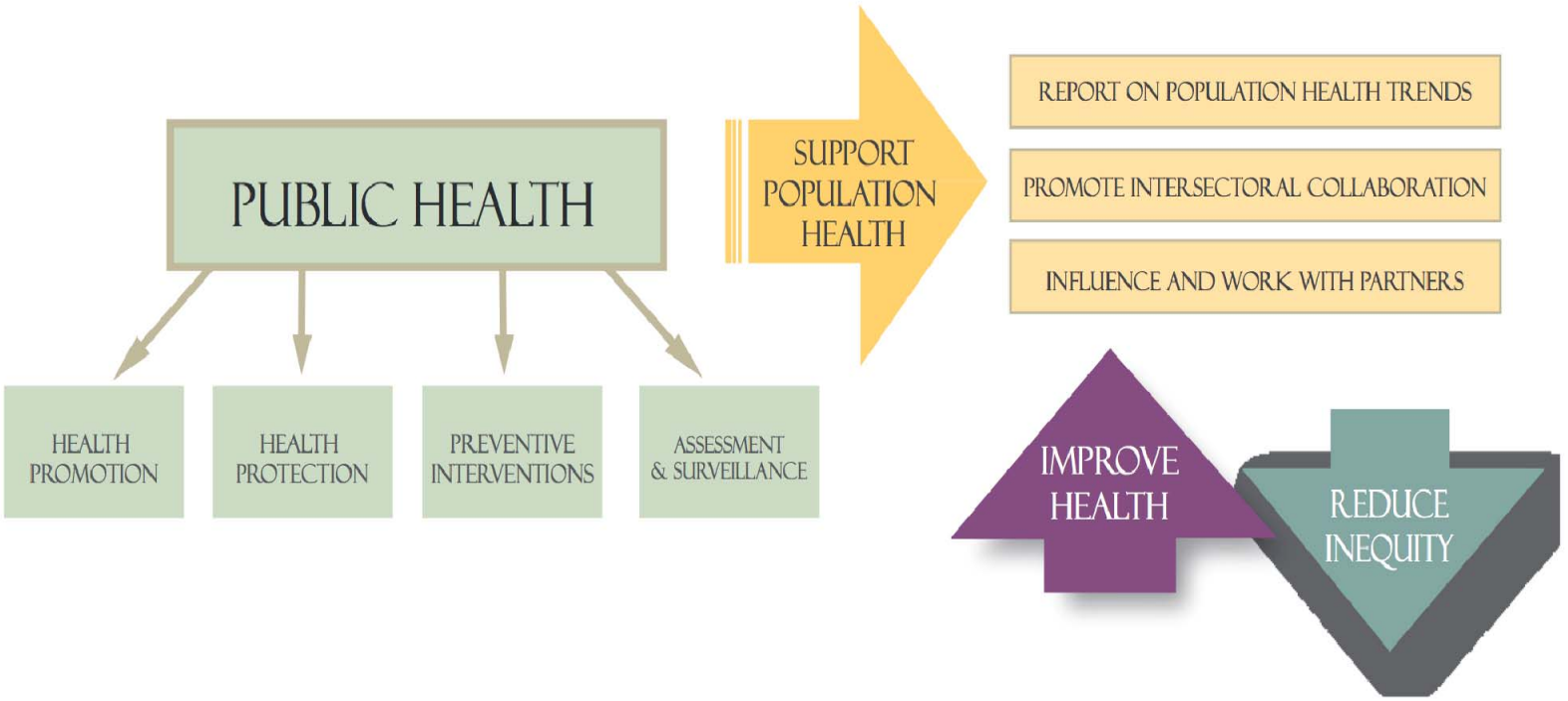
Moving Forward

GEVITY

- Sweet spot between EMRs and PHIS where there's a shared interest
- Fit for purpose is the over-riding principle
- Focus is on scope and interoperability
  - EMR is reactive
  - PHIS is proactive
- In the absence of declarative leadership, who guides selection decisions?

Long Game

GEVITY



GEVITY

DISCUSSION

Maureen Perrin, MSc, CPHIMS-CA, CAPM

Senior Consultant and Epidemiologist
Public Health Specialty Practice

e: mperrin@gevityinc.com
m: 613-799-4293
t: @cdnmoe

Margie Kennedy, PhD, RN, CPHIS-CA, PMP, PRINCE2 Practitioner

Associate Managing Partner, Senior Consultant and Clinical SME
Atlantic Branch

e: mkennedy@gevityinc.com
m: 902-402-5682
t: @KennedyMargie

Version: 0.93 (2014-10-09)

Gevity Consulting Inc.
#350 - 375 Water Street
Vancouver BC V6B 5C6
Canada