Identifying appropriate measures of deprivation for use with primary care health records

NAPCRG PBRN Conference
Thursday, June 24th, 2021
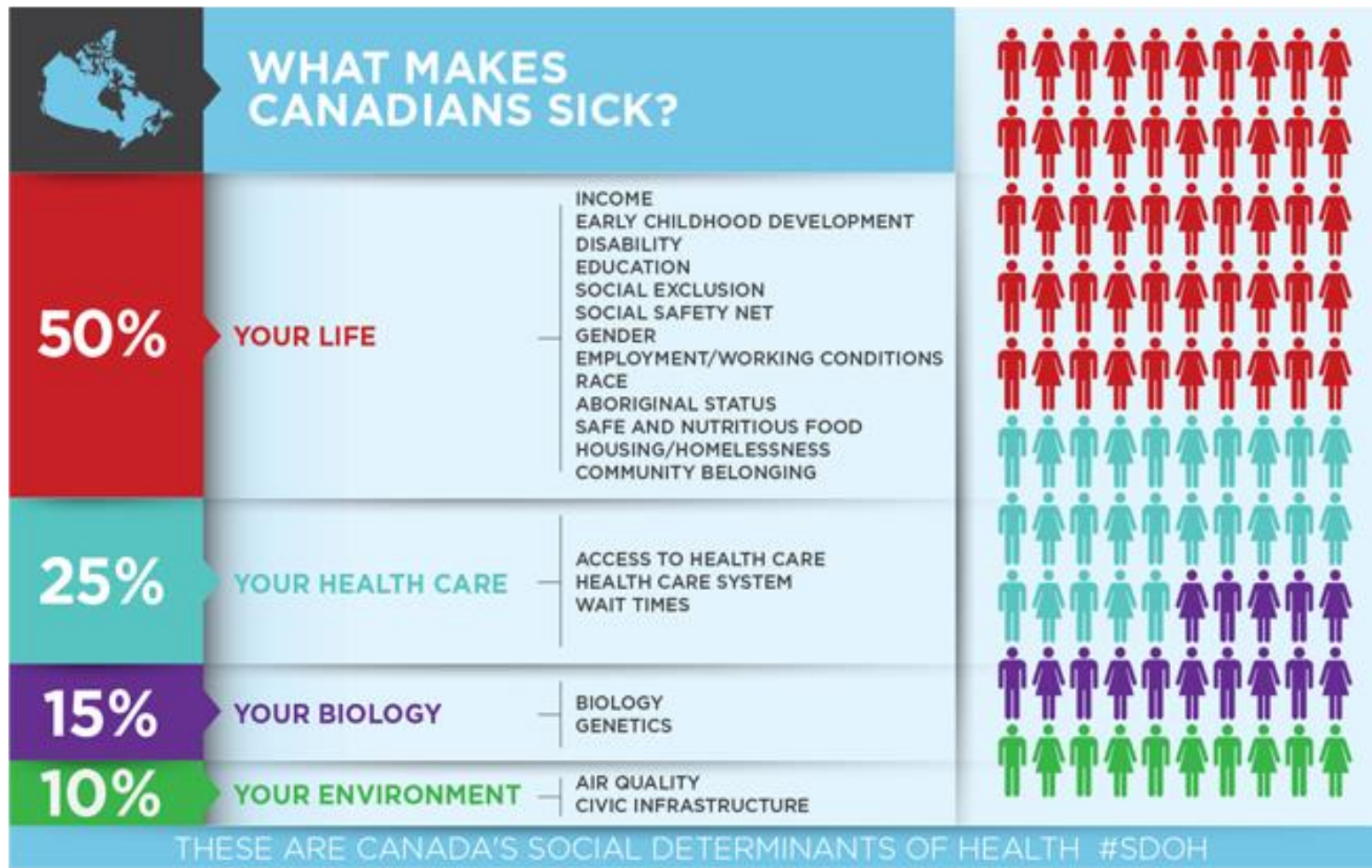**Simone Dahrouge, PhD Director OPEN/RASPO**

The Team

Research Team
- Researchers
- Clinicians
- Data Specialists

Research Team	
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- Ontario College of Family Physicians
- Canadian Institute for Health Information
- Public Health
- Clinician Researchers

OPEN
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RASPO
Réseau d'amélioration en soins primaires d'Ottawa

Social Determinants of Health

WHAT MAKES CANADIANS SICK?

50%	**YOUR LIFE**	INCOME EARLY CHILDHOOD DEVELOPMENT DISABILITY EDUCATION SOCIAL EXCLUSION SOCIAL SAFETY NET GENDER EMPLOYMENT/WORKING CONDITIONS RACE ABORIGINAL STATUS SAFE AND NUTRITIOUS FOOD HOUSING/HOMELESSNESS COMMUNITY BELONGING
25%	**YOUR HEALTH CARE**	ACCESS TO HEALTH CARE HEALTH CARE SYSTEM WAIT TIMES
15%	**YOUR BIOLOGY**	BIOLOGY GENETICS
10%	**YOUR ENVIRONMENT**	AIR QUALITY CIVIC INFRASTRUCTURE

THESE ARE CANADA'S SOCIAL DETERMINANTS OF HEALTH #SDOH

Aim

Identify the **neighbourhood** measures of vulnerability to link to EMR data
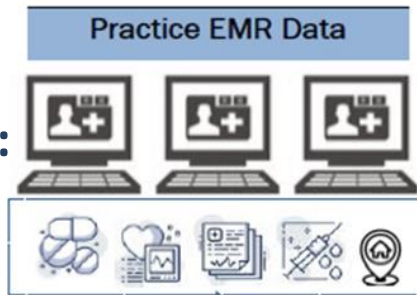
Purpose:

- o Assess Representativeness

- o Health Planning & Policy

- o Analytical

- o Action on the Social Determinants of Health
  - Adapted care delivery
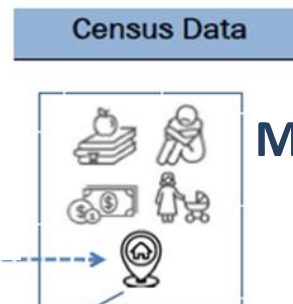 - Access to needed resources

Objectives and Approach

1) **Identify potential Measures of Vulnerability & Health Outcomes**

   ❑ Literature Search and Consultations

   ❑ <u>Vulnerability</u>: Census data and Indices derived from these

   ❑ <u>Outcome</u>: CPCSSN data ~ 2,000 MDs, ~ 2 million Patients

2) **Evaluate MOV's ability to discriminate**

   ❑ Link MOV and Health Outcomes (Postal Code)

   ❑ Assess associations between MOV and outcomes

3) **Produce Linked Dataset and recommendations**
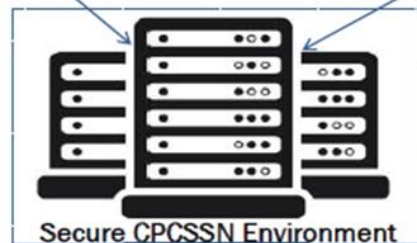
Approach

② **Health Outcomes: Across Life Span**

① **Measures of Vulnerability: Indices and Indicators**

③

Health Outcome = Constant + Measure of Vulnerability Quintiles

Objective #1a: Measures of Vulnerability

- Based on Census Data
- Aggregated data available only
- **Dissemination Area** level

Deriving Quintiles for a Measure

1) Calculate scores for each Dissemination Area across Canada
2) Order scores for all Dissemination Areas
3) Divide scores into quintiles
4) Assign quintile to each Dissemination Areas

1	2	3	4	5

Low Vulnerability → **High Vulnerability**

Objective #1a: Measures of Vulnerability
INDIVIDUAL INDICATORS

Material deprivation
Income
Education
Dwelling suitability

Residential instability
Social profile
Transiency
Dwelling type

Ethno-cultural composition
French language
Ethnic Profile
Immigration

Economic dependency
Dependency (age)
Unemployment

Objective #1b: Measures of Vulnerability INDICES

Pampalon
Material deprivation
Social deprivation

Canadian Marginalization Index (CAN-Marg)
Material deprivation
Residential instability
Dependency
Ethnic concentration

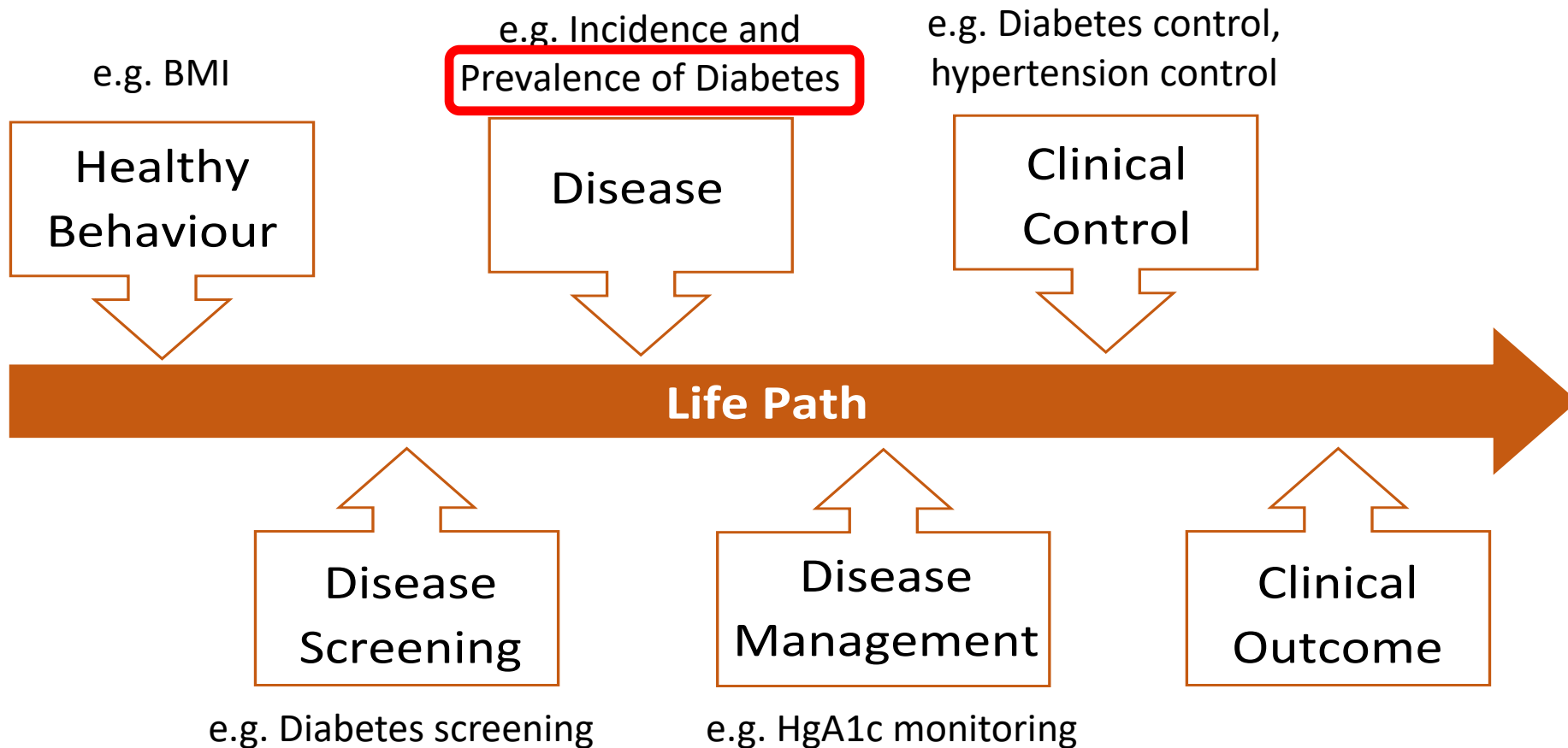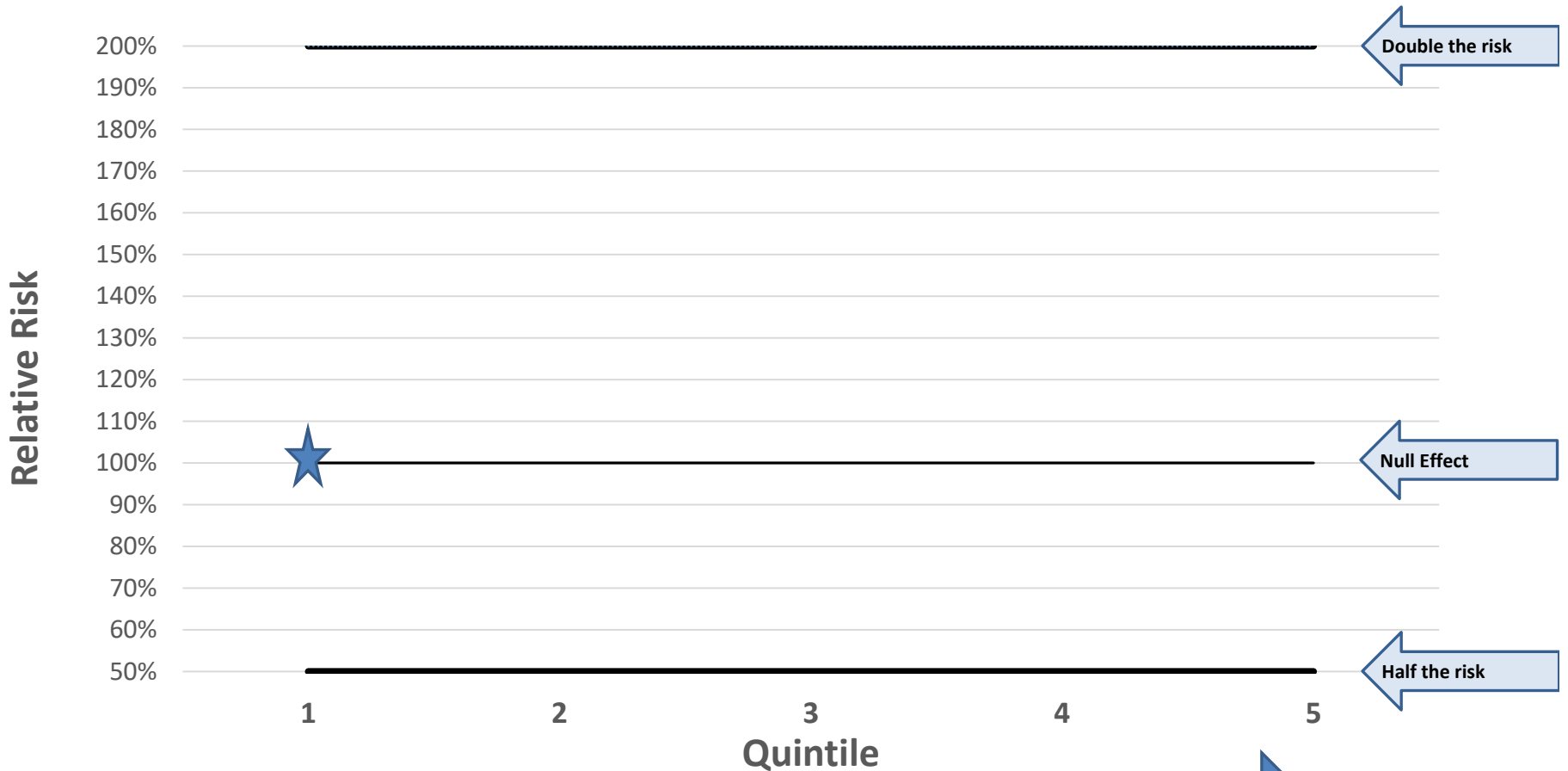| Canadian Index of Multiple Deprivation (CIMD) |
|---|
| Situational vulnerability |
| Residential instability |
| Economic dependency |
| Ethno-cultural composition |

Objective #1b: Health Measures
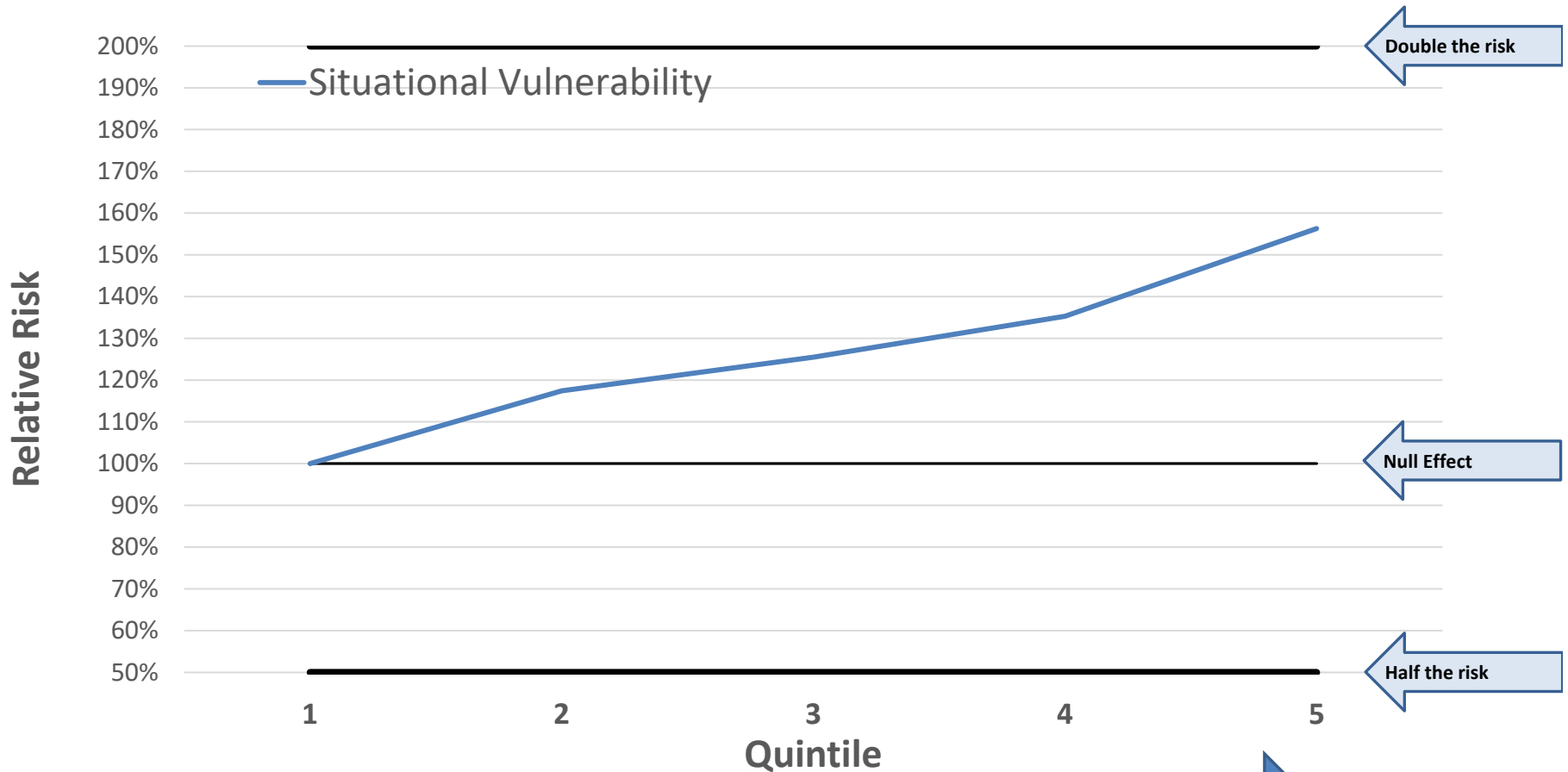
Strength of Measures of Vulnerability

~ 45% EMR records linked

CIMD Quintiles and Prevalence of Diabetes

Double the risk

Null Effect

Half the risk

Low Vulnerability   **High Vulnerability**

Strength of Measures of Vulnerability

CIMD Quintiles and Prevalence of Diabetes

Relative Risk (y-axis): 50%, 60%, 70%, 80%, 90%, 100%, 110%, 120%, 130%, 140%, 150%, 160%, 170%, 180%, 190%, 200%

— Situational Vulnerability

Double the risk (at 200%)

Null Effect (at 100%)

Half the risk (at 50%)

Quintile (x-axis): 1, 2, 3, 4, 5

Low Vulnerability → **High Vulnerability**

Strength of Measures of Vulnerability

CIMD Quintiles and Prevalence of Diabetes

Legend: Economic Dependency (green line), Situational Vulnerability (blue line)

Y-axis: Relative Risk (50% to 200%)

X-axis: Quintile (1 to 5)

Reference lines: Double the risk (200%), Null Effect (100%), Half the risk (50%)

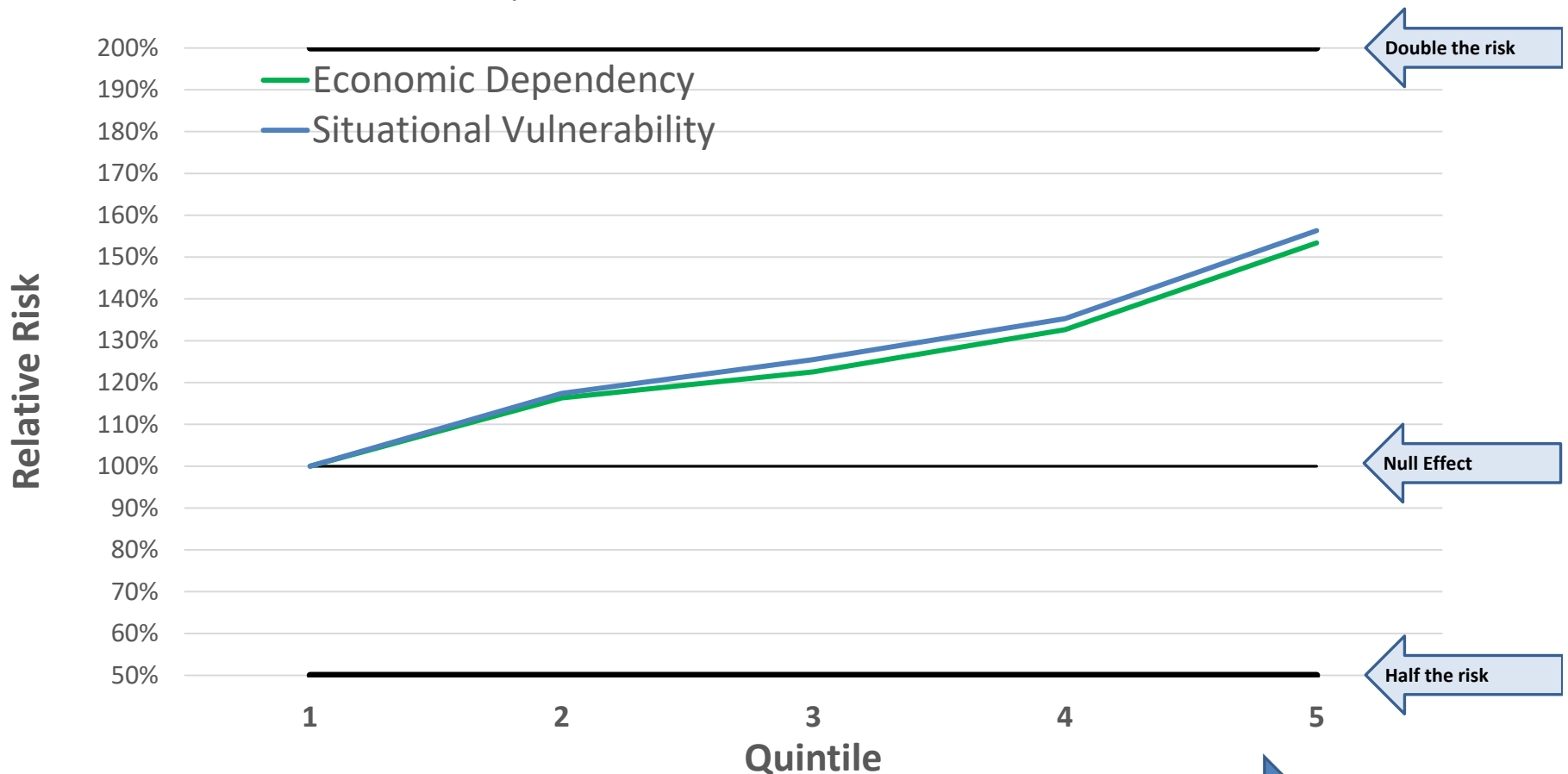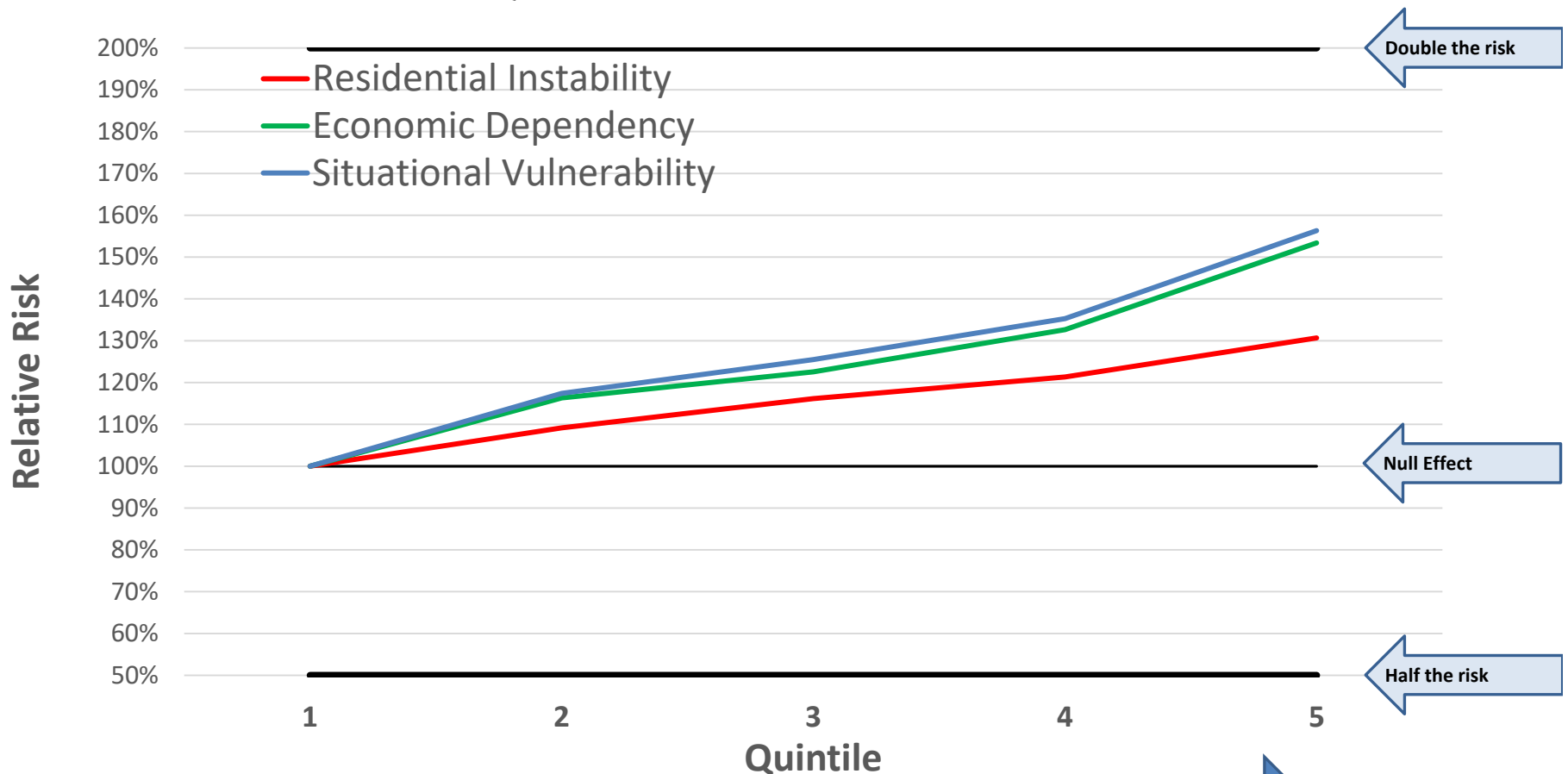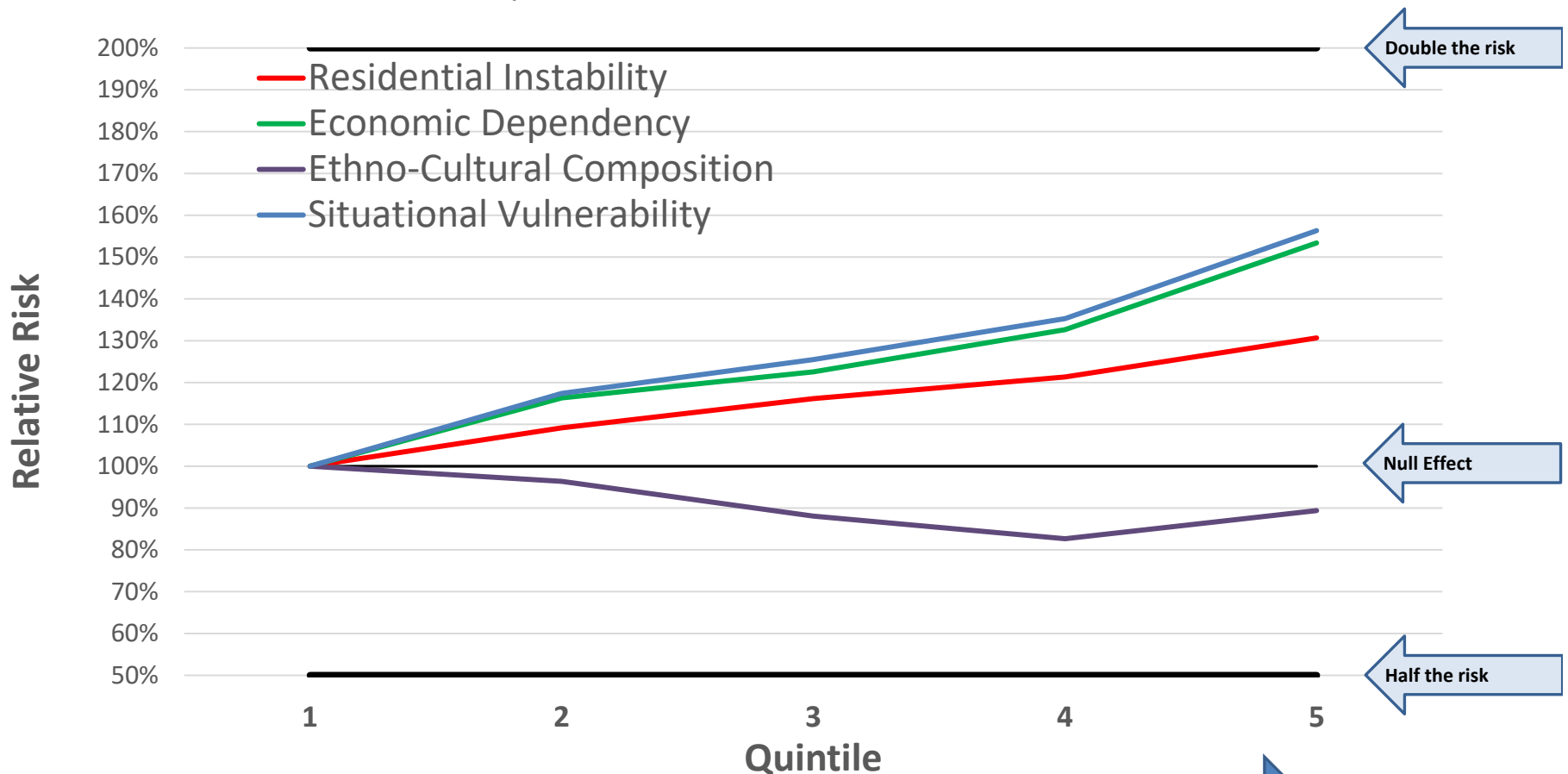Low Vulnerability → High Vulnerability

Strength of Measures of Vulnerability

CIMD Quintiles and Prevalence of Diabetes

Strength of Measures of Vulnerability
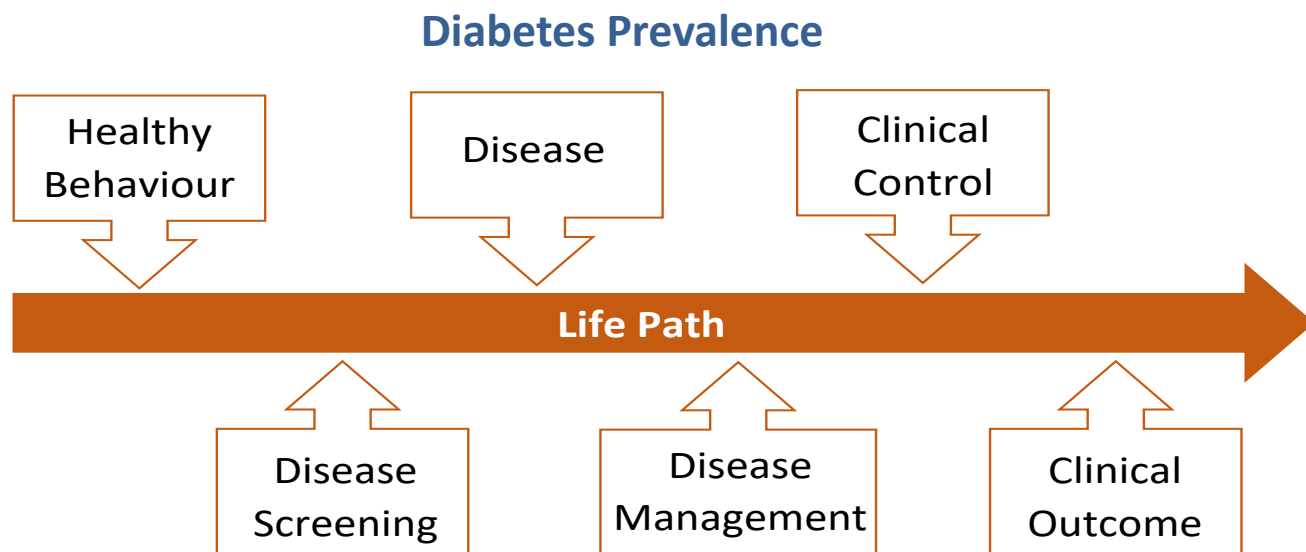
CIMD Quintiles and Prevalence of Diabetes

Double the risk

Null Effect

Half the risk

Relative Risk (y-axis: 50% to 200%)

Legend:
- Residential Instability
- Economic Dependency
- Ethno-Cultural Composition
- Situational Vulnerability

Quintile (x-axis: 1 to 5)

Low Vulnerability → High Vulnerability

CIMD Dimensions Quintiles & Diabetes Prevalence

	Situational vulnerability	Economic dependency	Residential instability	Ethno-cultural composition
Relationship	**Ordinal, Positive**	**Ordinal, Positive**	**Ordinal, Positive**	**Inconsistent**
Ability to Discriminate	**56%**	**53%**	**31%**	**-**

Diabetes Prevalence

Healthy Behaviour · Disease · Clinical Control

Life Path

Disease Screening · Disease Management · Clinical Outcome

Conclusions

1) **Identify potential Measures of Vulnerability & Health Outcomes**

   ❑ Feasible

   ❑ Must increase availability of full postal code

2) **Evaluate Measures of Vulnerability ability to discriminate**

   ❑ Promising

   ❑ Varies across dimensions

   ❑ Other Measures to Analyse