

South Africa - Multilevel and spatial determinants of multimorbidity and optimal co-care delivery model in South Africa

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Overview

Identification

ID NUMBER

AHRI.Vukuzazi.GeoSpatial.Multimorbidity.2019.V1.0

Version

VERSION DESCRIPTION

V1.0

Overview

ABSTRACT

We aim to identify the interactive effects and associations of the key individual, familial, household, and community determinants of communicable and non-communicable disease multimorbidity in rural kwazulu-natal. We will use state-of-the-art multi-level and spatial modelling techniques to understand the complex mechanisms and spatial distribution of the epidemics and establish a multilevel analytical, methodological, and theoretical framework to investigate emerging multimorbidity epidemics in other similar in ssa. The specific objectives are as following:

Aim 1. To quantify the spatial distribution of individual and multimorbid communicable and non-communicable disease epidemiology in rural kwazulu-natal. We posit that the spatial distribution and geographic density of prevalence of HIV, TB and NCDs (hypertension, diabetes and obesity) epidemics are heterogeneous with overlapping hot-spot areas within the surveillance area characterized by urbanicity, and social and economic activities. Understanding the geospatial distribution will inform the development of targeted interventions for disease prevention, management, and treatment.

Aim 2. To measure the relative and interactive contributions of individual, familial, household, and community factors on disease multimorbidity. We hypothesize that household and community factors substantially contribute to the presence of multimorbidity accounting for biological, individual or familiar factors and that key causal pathways exist across different comorbidity conditions. Multilevel regression models will allow quantifying the effects of different individual and contextual determinants and their interactions on multimorbidity as well as the level of clustering within household members or at the community-level.

Aim 3. To evaluate an optimal co-care delivery model for multimorbidity using agent-based simulation model (i.e. EMOD HIV/TB). We posit that provision of prevention and treatment for multimorbidity can be optimized through the co-care delivery model at both individual and population levels. We aim to adapt an existing EMOD HIV/TB model to interact with other multiple comorbidity conditions such as diabetes and hypertension. Model parameters for progression to different comorbidity conditions will be determined and calibrated to the key factors and epidemiological data from aim 1 and 2 as well as the longitudinal population-based demographic and hiv surveillance data. We will also estimate costs and effectiveness (i.e. disability-adjusted life year) for different scenarios of co-care delivery models.

KEYWORDS

HIV,TB, NCD, spatial, multimorbidity, optimal care delivery

Coverage

GEOGRAPHIC COVERAGE

Producers and Sponsors

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Metadata Production

METADATA PRODUCED BY

Name	Abbreviation	Affiliation	Role
Africa Health Research Institute	AHRI		

DDI DOCUMENT ID

DDI.AHRI.Vukuzazi.GeoSpatial.Multimorbidity.2019.V1.0

Sampling

Sampling Procedure

Questionnaires

No content available

Data Collection

Data Collection Dates

Start	End	Cycle
2018-05-25	2019-11-19	N/A

Data Processing

No content available

Data Appraisal

No content available

File Description

Variable List

AHRI.Vukuzazi.VukuzaziGeoSpatialMultimorbidity.2019.V1.0

Content

Cases 16997

Variable(s) 21

Structure Type:
Keys: ()

Version

Producer

Missing Data

Variables

ID	Name	Label	Type	Format	Question
V339	IndividualId	Unique Internal Id of Individual	contin	numeric	
V340	IntId	PIP Individual identifier	contin	numeric	
V341	Sex	Gender	discrete	numeric	
V342	DateOfBirth	Individual's Date of Birth	discrete	character	
V343	ClinicVisitDate	Mobile Clinic Visit Date	discrete	character	
V344	Rifampicin	Rifampicin Resistance	discrete	numeric	
V345	GeneXpert	TB GeneXpert Test Result	discrete	numeric	
V346	LiquidCulture	Liquid Culture Result(MGIT)	discrete	numeric	
V347	HIVelisa	HIV Elisa Result	discrete	numeric	
V348	VL	HIV Viral Load Result	discrete	numeric	
V349	TBTxCurrnt	Are you currently on TB treatment?	discrete	numeric	
V350	TBTxEver	Have you been on TB treatment before?	discrete	numeric	
V351	RadOldTB	Radiologist Diagnostic OldTB	discrete	numeric	
V352	BPSecondSystolic	BP Second Systolic	contin	numeric	
V353	BPThirdSystolic	BP Third Systolic	contin	numeric	
V354	BPSecondDiastolic	BP Second Diastolic	contin	numeric	
V355	BPThirdDiastolic	BP Third Diastolic	contin	numeric	
V356	HighBPTx2wks	In the past two weeks, have you taken any drugs (medication) for raised blood pre	discrete	numeric	
V357	HBA1CPercent	HBA1C Percent	contin	numeric	
V358	InsulinTxCurr	Are you currently taking insulin for diabetes prescribed by a doctor or other hea	discrete	numeric	
V359	HighBSugarTx2wks	In the past two weeks, have you taken any drugs (medication) for diabetes prescri	discrete	numeric	

Unique Internal Id of Individual (IndividualId)

File: AHRI.Vukuzazi.VukuzaziGeoSpatialMultimorbidity.2019.V1.0

Overview

Type: Continuous	Valid cases: 16997
Format: numeric	Invalid: 0
Width: 12	Minimum: 5
Decimals: 0	Maximum: 37359
Range: 5-37359	Mean: 17759.1
	Standard deviation: 10897.1

PIP Individual identifier (IIntId)

File: AHRI.Vukuzazi.VukuzaziGeoSpatialMultimorbidity.2019.V1.0

Overview

Type: Continuous	Valid cases: 16997
Format: numeric	Invalid: 0
Width: 12	Minimum: 17
Decimals: 0	Maximum: 242166
Range: 17-242166	Mean: 76572.1
	Standard deviation: 52567.5

Gender (Sex)

File: AHRI.Vukuzazi.VukuzaziGeoSpatialMultimorbidity.2019.V1.0

Overview

Type: Discrete	Valid cases: 16997
Format: numeric	Invalid: 0
Width: 12	
Decimals: 0	
Range: 1-9	

Individual's Date of Birth (DateOfBirth)

File: AHRI.Vukuzazi.VukuzaziGeoSpatialMultimorbidity.2019.V1.0

Overview

Type: Discrete	Valid cases: 16997
Format: character	Minimum: NaN
Width: 11	Maximum: NaN

Mobile Clinic Visit Date (ClinicVisitDate)

File: AHRI.Vukuzazi.VukuzaziGeoSpatialMultimorbidity.2019.V1.0

Overview

Type: Discrete	Valid cases: 16973
Format: character	Minimum: NaN
Width: 11	Maximum: NaN

Rifampicin Resistance (Rifampicin)

File: AHRI.Vukuzazi.VukuzaziGeoSpatialMultimorbidity.2019.V1.0

Overview

Rifampicin Resistance (Rifampicin)

File: AHRI.Vukuzazi.VukuzaziGeoSpatialMultimorbidity.2019.V1.0

Type: Discrete
 Format: numeric
 Width: 10
 Decimals: 0
 Range: 0-7
 Invalid: 11

Valid cases: 8776
 Invalid: 8221

TB GeneXpert Test Result (GeneXpert)

File: AHRI.Vukuzazi.VukuzaziGeoSpatialMultimorbidity.2019.V1.0

Overview

Type: Discrete
 Format: numeric
 Width: 10
 Decimals: 0
 Range: 1-7
 Invalid: 11

Valid cases: 8776
 Invalid: 8221

Liquid Culture Result(MGIT) (LiquidCulture)

File: AHRI.Vukuzazi.VukuzaziGeoSpatialMultimorbidity.2019.V1.0

Overview

Type: Discrete
 Format: numeric
 Width: 10
 Decimals: 0
 Range: 1-7
 Invalid: 11

Valid cases: 8356
 Invalid: 8641

HIV Elisa Result (HIVElisa)

File: AHRI.Vukuzazi.VukuzaziGeoSpatialMultimorbidity.2019.V1.0

Overview

Type: Discrete
 Format: numeric
 Width: 10
 Decimals: 0
 Range: 1-3
 Invalid: 11

Valid cases: 16822
 Invalid: 175

HIV Viral Load Result (VL)

File: AHRI.Vukuzazi.VukuzaziGeoSpatialMultimorbidity.2019.V1.0

Overview

Type: Discrete
 Format: numeric
 Width: 10
 Decimals: 0
 Range: 1-10000001
 Invalid: 100000001

Valid cases: 5718
 Invalid: 11279

Are you currently on TB treatment? (TBTxCurrent)

File: AHRI.Vukuzazi.VukuzaziGeoSpatialMultimorbidity.2019.V1.0

Overview

Type: Discrete
 Format: numeric
 Width: 12
 Decimals: 0
 Range: 1-3

Valid cases: 16973
 Invalid: 24

Have you been on TB treatment before? (TBTxEver)

File: AHRI.Vukuzazi.VukuzaziGeoSpatialMultimorbidity.2019.V1.0

Overview

Type: Discrete
 Format: numeric
 Width: 12
 Decimals: 0
 Range: 1-3

Valid cases: 16973
 Invalid: 24

Radiologist Diagnostic OldTB (RadOldTB)

File: AHRI.Vukuzazi.VukuzaziGeoSpatialMultimorbidity.2019.V1.0

Overview

Type: Discrete
 Format: numeric
 Width: 12
 Decimals: 0
 Range: 1-3

Valid cases: 2677
 Invalid: 14320

BP Second Systolic (BPSecondSystolic)

File: AHRI.Vukuzazi.VukuzaziGeoSpatialMultimorbidity.2019.V1.0

Overview

Type: Continuous
 Format: numeric
 Width: 12
 Decimals: 0
 Range: 1-7128

Valid cases: 16969
 Invalid: 28
 Minimum: 1
 Maximum: 7128
 Mean: 120.3
 Standard deviation: 60.6

BP Third Systolic (BPThirdSystolic)

File: AHRI.Vukuzazi.VukuzaziGeoSpatialMultimorbidity.2019.V1.0

Overview

Type: Continuous
 Format: numeric
 Width: 12
 Decimals: 0
 Range: 10-12968

Valid cases: 16969
 Invalid: 28
 Minimum: 10
 Maximum: 12968
 Mean: 119
 Standard deviation: 101.7

BP Second Diastolic (BPSecondDiastolic)

File: AHRI.Vukuzazi.VukuzaziGeoSpatialMultimorbidity.2019.V1.0

Overview

Type: Continuous	Valid cases: 16969
Format: numeric	Invalid: 28
Width: 12	Minimum: 5
Decimals: 0	Maximum: 6985
Range: 5-6985	Mean: 74.8
	Standard deviation: 55

BP Third Diastolic (BPThirdDiastolic)

File: AHRI.Vukuzazi.VukuzaziGeoSpatialMultimorbidity.2019.V1.0

Overview

Type: Continuous	Valid cases: 16969
Format: numeric	Invalid: 28
Width: 12	Minimum: 7
Decimals: 0	Maximum: 7372
Range: 7-7372	Mean: 74.4
	Standard deviation: 76.3

In the past two weeks, have you taken any drugs (medication) for raised blood pre (HighBPTx2wks)

File: AHRI.Vukuzazi.VukuzaziGeoSpatialMultimorbidity.2019.V1.0

Overview

Type: Discrete	Valid cases: 9630
Format: numeric	Invalid: 7367
Width: 12	
Decimals: 0	
Range: 1-3	

HBA1C Percent (HBA1CPercent)

File: AHRI.Vukuzazi.VukuzaziGeoSpatialMultimorbidity.2019.V1.0

Overview

Type: Continuous	Valid cases: 16821
Format: numeric	Invalid: 176
Width: 10	Minimum: 3.7
Decimals: 0	Maximum: 18.9
Range: 3.7-18.9	Mean: 5.8
Invalid: 101	Standard deviation: 1.2

Are you currently taking insulin for diabetes prescribed by a doctor or other hea (InsulinTxCurr)

File: AHRI.Vukuzazi.VukuzaziGeoSpatialMultimorbidity.2019.V1.0

Overview

Are you currently taking insulin for diabetes prescribed by a doctor or other health professional (InsulinTxCurr)

File: AHRI.Vukuzazi.VukuzaziGeoSpatialMultimorbidity.2019.V1.0

Type: Discrete
Format: numeric
Width: 12
Decimals: 0
Range: 1-3

Valid cases: 8092
Invalid: 8905

In the past two weeks, have you taken any drugs (medication) for diabetes prescribed by a doctor or other health professional (HighBSugarTx2wks)

File: AHRI.Vukuzazi.VukuzaziGeoSpatialMultimorbidity.2019.V1.0

Overview

Type: Discrete
Format: numeric
Width: 12
Decimals: 0
Range: 1-3

Valid cases: 8092
Invalid: 8905

Documentation

Technical documents

DDI:Vukuzazi GeoSpatial Multimorbidity

Title DDI:Vukuzazi GeoSpatial Multimorbidity
Author(s) Sweetness H Dube
Date 28/11/2019
Country South Africa
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