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ISDS INTERNATIONAL SOCIETY FOR DISEASE SURVEILLANCE

Profile: Karachi Health and Demographic Surveillance System of Pakistan (KHDSS)

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Objective

The mandate of establishing this DSS is to provide a research platform for both observational and interventional studies, with focus on maternal and child health, which could influence decision-making and planning for health strategies at local, national and international levels.

Introduction

The Karachi Health and Demographic Surveillance System was set up in year 2003 by the Department of Pediatrics and Child Health of the Aga Khan University, Karachi, Pakistan, in four peri-urban low socioeconomic communities of Karachi and covers an area of 17.6 square kilometers.(Figure 1).

Methods

Total population currently under surveillance is 299,009 for which a record of births, deaths, pregnancies and migration events is maintained by two monthly household visits. At each re-enumeration, Community Health Workers move through the area using GIS-derived maps and collect the information from households and conduct verbal autopsies for stillbirths and deaths of children under the age of five and adult female. Primary Health Care centre at each site provide free care to children under 5.

Results

The demographic characteristics for the year 2016 are summarized in Table 1. The main demographic indicators for a period of five years enable us to study the trends of population dynamics and reasons for the change in the rates of stillbirth, under 5 children mortality and maternal mortality (Table 2). Under 5 mortality rates peaked in 2013 and 2016 due to measles epidemic. Within the time period of five years, a reduction in neonatal mortality rates is observed (Table 2).

For over a decade, the KHDSS has been a platform for a variety of studies. At the outset, various epidemiological studies were conducted in the area of infectious diseases of children, identifying signs and symptoms in young infant requiring urgent referral, vaccine coverage and the impact of multiple interventions. The focus was on measuring burden of relevant and common childhood illnesses. Some of these projects include: calculation of the incidence of various infectious diseases like typhoid bacteremia, pneumonia and diarrhea, evaluation of effectiveness of various treatment regimens for neonatal sepsis, assessment of the acceptance of hospitalized care, determining etiology of moderate to severe diarrhea, assessment of burden and etiology of neonatal sepsis and a multi-center cohort measuring the burden of stillbirths, neonatal and maternal deaths. (1-5)

Conclusions

All the studies aim for improvement of public health policies and informed decision making at local and national levels. We have also established a bio-repository of a well-defined maternal and newborn cohort.

Demographic Surveillance System Profile 2016

Indicators	2016
Total Population	299,009
Total Area	17.6 Sq. Km
Total Structures	42,093
Total Households	43,098
Population Density/Sq. Km	16,964
Total Male, n(%)	155,485(52)
Total Female, n(%)	143,524(48)
Total population 15-49years (females)	74,752(25)
Married women, n(%)	43,448(15)
Children <5years, n(%)	40,998(14)
Annual pregnancies	8264
Annual Livebirths	7525

Demographic Surveillance indicators and Trends by Year (2012-2016)

Indicators (rates/ratios)	2012	2013	2014	2015	2016
Crude birth rate(CBR)/1000 population	29.9	27.3	26	28.7	25.2
Maternal mortality ratio(MMR)/100,000 Live births	426.9	361	427	373.6	336.2
Neonatal mortality rate(NMR)/1000 live births	44.8	51	42.3	37	39.5
Infant mortality rate(IMR)/1000 live births	66.7	77	65.8	58	62.5
Under-five mortality rate(U5MR)/1000 live births	78.5	89	77.2	70.9	76.7
Stillbirth rate(SBR)/1000 Births	26.9	33	34.8	27	30.3
Pregnancy rate/1000 Women aged 15-49 Years	186.6	163.2	157	183.4	185.6
Abortion rate/1000 Women aged 15-49 years	5	5.8	4	6.1	7
General fertility rate (GFR)/1000 Women aged 15-49	119.6	109.2	104	114.9	100.7
Sex ratio (male to Female)	1.1	1.1	1.1	1.1	1.1
Child-woman ratio	707	683	629	608	548
In-migration/1000 Midyear Population	54.3	44.2	33.7	21.1	25.0
Out-migration/1000 Midyear Population	20	13.5	6.4	3.9	2.8
Crude net migration rate	34.3	30.8	27.3	17.1	22.2

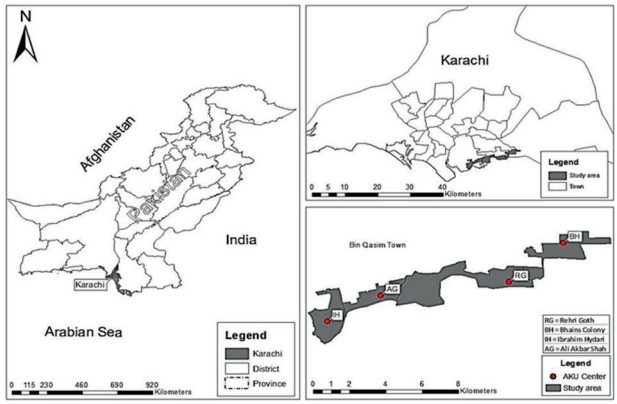

Figure 1: Map showing location of the DSS sites in Karachi, Pakistan.

Keywords

Karachi Health and Demographic Surveillance System; low socio-economic communities; child and maternal health; research platform; Etiological studies and controlled trials

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