

Trends of Reported Human Cases of Brucellosis, Kingdom of Saudi Arabia, 2004 – 2012

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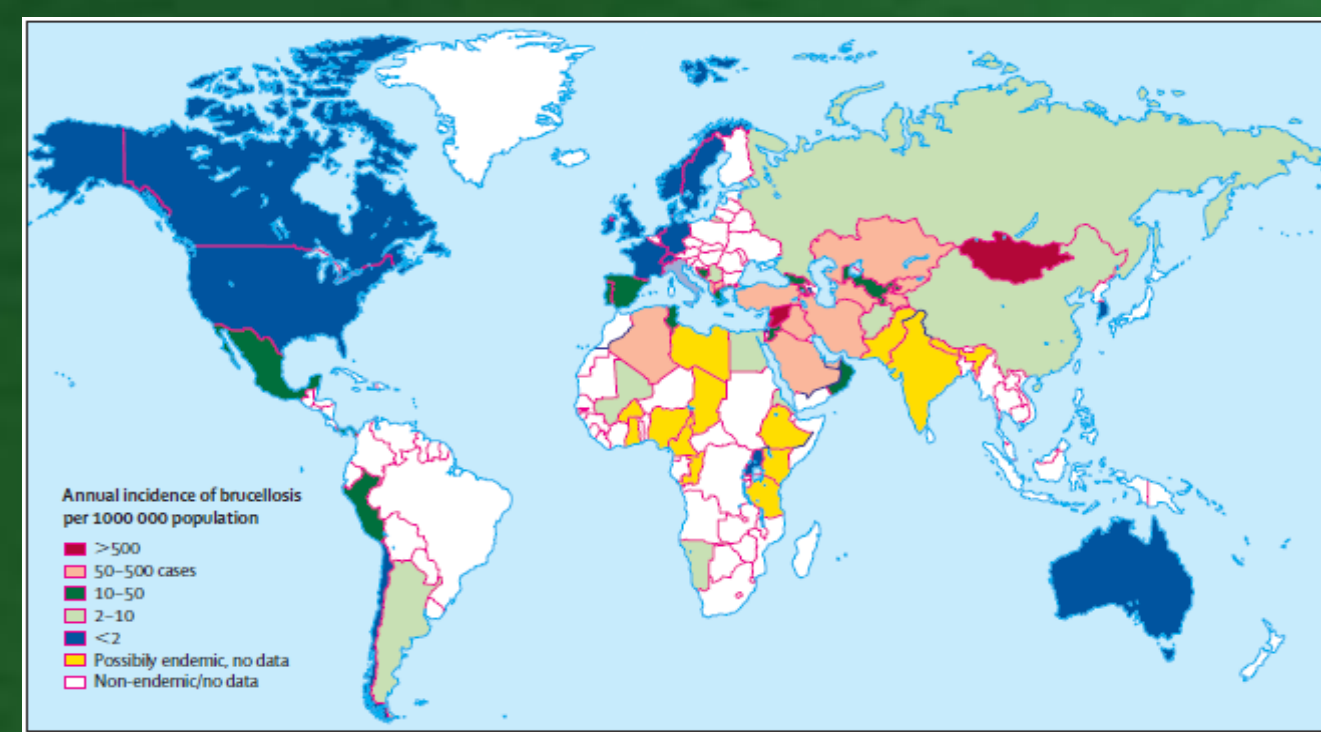
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Introduction

- Brucellosis is a systemic infectious disease transmitted mainly to humans through ingestion of raw or unpasteurized milk infected with *Brucella* organisms
- Main animals affected are sheep, cattle, camels, pigs, and dogs
- Brucellosis is endemic in Kingdom of Saudi Arabia (KSA) and classified as notifiable disease by Saudi Ministry of Health (MoH)

Figure 1: World Incidence of Human Brucellosis, 2006



Objectives

- Analyze reported human brucellosis disease trends in KSA over 9 years (2004 - 2012)
- Discuss distribution and determination of cases by region, gender, age group, and nationality, taking into account occurrences per month
- Identify potential endemic foci
- Make evidence-based recommendations for enhancing public health action

Methods

- Brucellosis data was collected from Infectious Disease Department of KSA MoH, while population data was collected from Ministry of Economy and Planning, Saudi Central Department of Statistics and Information
- Exploratory and descriptive analyses were conducted for cases and overall population
- Cumulative numbers calculated by age group and month of year from 2004 – 2012
- Trends of incidence rates (IRs) per 100,000 persons were determined by gender and nationality from 2004 – 2012 and by region from 2007 – 2012

Table 1. Reported Cases and Incidence Rates^a of Human Brucellosis, by Year, Kingdom of Saudi Arabia, 2004 – 2012

Year	# Cases (IR ^a)	95% CI ^a
2004	5,169 (22.9)	22.3 – 23.5
2005	3,804 (16.3)	15.8 – 16.8
2006	3,997 (16.6)	16.1 – 17.1
2007	4,194 (16.8)	16.3 – 17.3
2008	3,447 (13.4)	12.9 – 13.8
2009	4,803 (18)	17.5 – 18.5
2010	4,460 (16.2)	15.7 – 16.7
2011	3,942 (13.9)	13.5 – 14.3
2012	3,661 (12.5)	12.1 – 13
Total	37,477	

^aIR = incidence rate per 100,000 population
^aCI = confidence interval

Figure 2. Incidence Rates^a of Reported Cases of Human Brucellosis, by Gender and Nationality, Kingdom of Saudi Arabia, 2004 – 2012

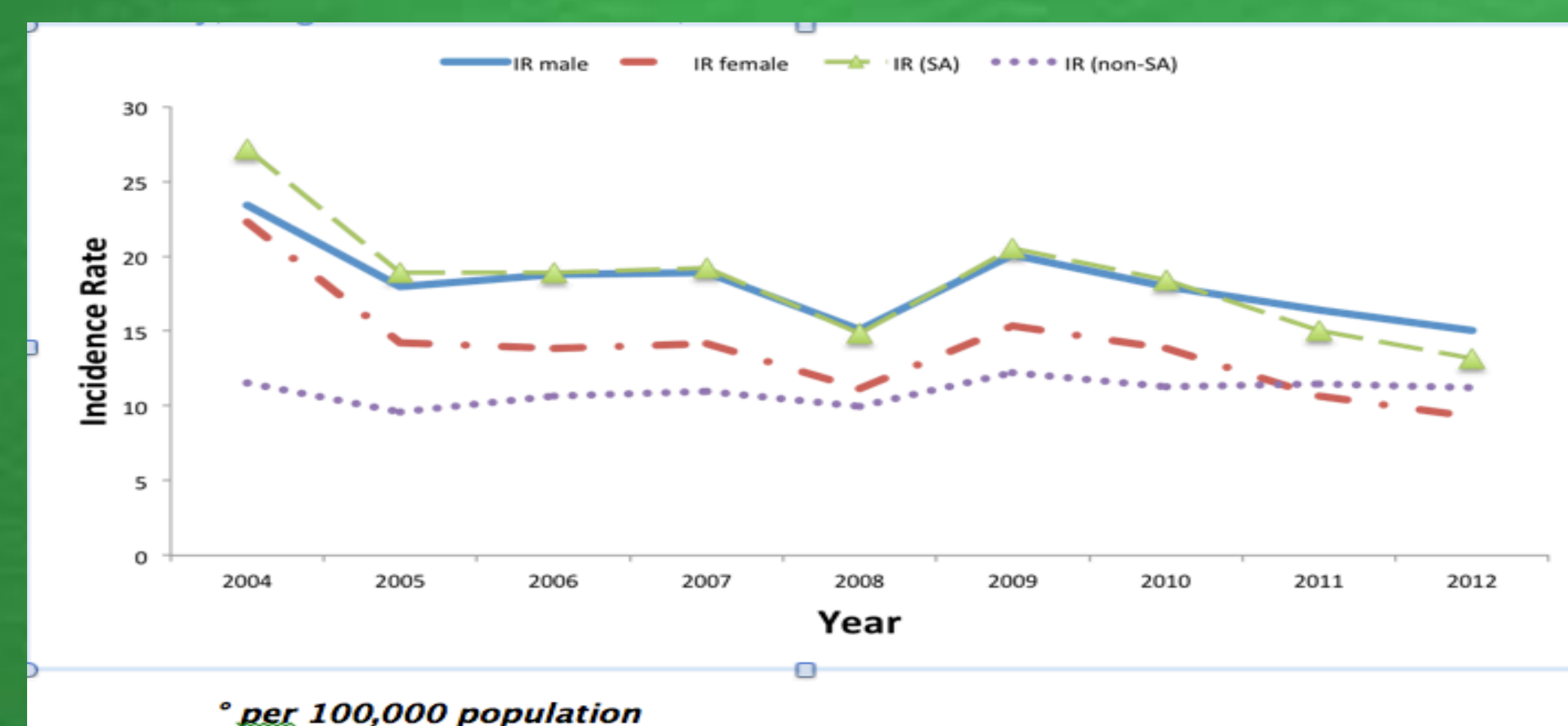
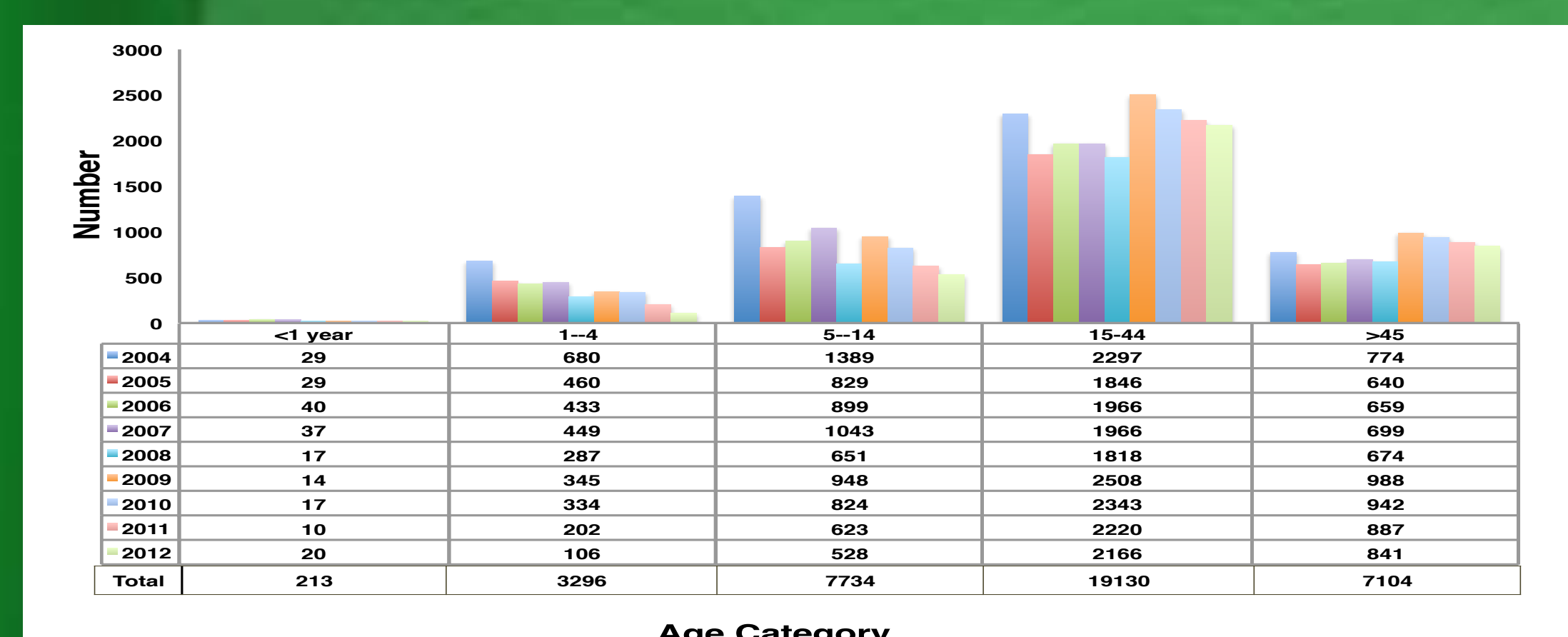


Figure 3. Reported Cases of Human Brucellosis, by Age Group, Kingdom of Saudi Arabia, 2004 – 2012



Results

- Total of 37, 477 reported human brucellosis cases from 2004 – 2012
- IRs significantly decreased from 22.9 in 2004 (95% CI=22.3, 23.5) to 12.5 in 2012 (95% CI=12.1, 13)
- Those aged 15 – 44 years had greater number of cases (19,130) than any other age group
- Most cases reported during spring and summer seasons
- Males had consistently higher IR than females
- IR of Saudi citizens was significantly greater than that of non-Saudis, but this difference shrank over time
- IRs of Al-Qassim, Aseer, and Hail were in the highest 25th percentile
- IRs of Al-Jouf, Jazan, Makkah, and Al-Riyadh were in the lowest 25th percentile

Discussion

- Results show that brucellosis is major health problem in Saudi Arabia
- From 2004 to 2012, the incidence rates of brucellosis fell, but IR was still higher than that of developed countries and most other developing countries
- Young, male Saudi citizens living in highly endemic areas were at greatest risk of contracting brucellosis

Figure 4. Reported Cases of Human Brucellosis, by Month of the Year, Kingdom of Saudi Arabia, 2004 – 2012

Year	January	February	March	April	May	June	July	August	September	October	November	December	Total
2004	380	383	494	556	557	447	603	410	447	307	236	345	5169
2005	187	346	459	374	321	464	355	303	284	227	179	305	3804
2006	260	304	449	410	393	430	420	315	352	192	265	198	3997
2007	243	300	411	412	486	521	344	389	350	225	276	237	4194
2008	189	311	418	415	487	386	9	323	196	229	277	207	3447
2009	270	360	463	622	537	555	562	359	224	334	272	255	4803
2010	284	355	349	579	462	439	434	420	382	325	247	279	4460
2011	337	306	448	459	434	452	306	203	273	291	234	259	3942
2012	229	274	347	425	536	313	266	255	272	245	263	292	3661
Total	2380	2939	3838	4252	4213	4007	3298	2877	2780	2333	2229	2331	37477

Percentile: 25 50 75

Figure 5. Incidence Rates^a of Reported Cases of Human Brucellosis, by Region, Kingdom of Saudi Arabia, 2004 – 2012

Year	Al-Riyadh	Makkah	Al-Madinah	Al-Qassim	Eastern Region	Aseer	Tabouk	Hail	Northern Borders	Jazan	Najran	Al-Jouf	Al-Baha
2007	7.8	5.2	7.6	76.1	16.5	61.8	9.6	43.7	37.2	9.6	32.2	2.1	16.3
2008	5.1	4.2	4.9	70.9	12.7	43.0	7.0	57.6	37.8	5.0	33.5	2.5	8.5
2009	8.1	6.6	7.9	94.6	18.6	55.5	4.8	67.2	38.4	6.2	48.1	2.9	15.6
2010	4.3	5.9	19.9	86.1	15.5	49.6	7.6	53.9	25.3	5.0	41.3	1.6	8.3
2011	5.3	3.7	12.7	61.6	13.5	44.0	7.3	62.5	25.2	3.5	38.1	2.8	5.8
2012	6.2	3.0	9.2	69.6	11.0	38.8	1.5	32.7	34.5	4.2	22.4	3.8	18.0

^a per 100,000 population
Percentile: 25 50 75

Recommendations

- Implement governmental surveillance program for brucellosis prevention
- Enforce animal importation protocols and implement compulsory vaccination for all susceptible animals
- Increase level of education and awareness among people, especially people who are at risk, such as shepherds, abattoirs, and laboratory workers
- Encourage rural health centers to be major participants in awareness and education campaigns
- Increase biosafety level in laboratories to level 3

Acknowledgments

- Special thanks to Dr. Scott McNabb and King Abdullah Fellowship Program team for their support
- Thank you to the entire Infectious Disease Department staff at the Saudi MoH

