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*Session 037: Measuring Maternal Mortality through the 2010 round of population censuses*

# **Maternal Mortality in South Africa: update from Community Survey, 2007**

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# Maternal mortality in South Africa

- Controversial issue
- Several sources:
  - Vital registration
  - Census and surveys
  - Demographic Surveillance System
  - Hospital data
- Levels, Trends, Differentials
  - Major discrepancies on levels
  - Agreement about recent increase
  - Very large differences (regional, socio-economic status ...)

# Issues related with maternal mortality in developing countries

- Case definitions
  - Demographic: “Pregnancy related death” (any death during maternal period) = direct + indirect + fortuitous
  - Medical: “Direct obstetric causes”
  - Major issue in case of high young adult mortality (HIV/AIDS + external causes)
- Changing relationship with socio-economic status, because of the HIV/AIDS epidemic
  - General issue for causes of death
  - Particularly relevant for maternal mortality
- Earlier publication based on 2001 census data, in: *Population Health Metrics*, 2008 (4):1-13

# Census data on maternal mortality in South Africa

- Recent sources:
  - Census, 2001 (1/10 sample available)
  - Community Survey, 2007 (1/43 sample)
- Both include:
  - Births in past 12 months
  - Deaths in past 12 months
  - Maternal deaths, for women aged 12-50 / demographic definition = Deaths during pregnancy, delivery or within 6 weeks of delivery / No information on direct and indirect causes
  - Deaths from external causes (accidents and violence)

# Potential of census data in South Africa (2001 & 2007)

- Allows to compute all maternal mortality indicators
  - MMR: maternal mortality ratio
  - MDR: maternal death rate
  - MMR: life time risk (maternal mortality quotient)
- Allows differential analysis
  - Variety of socio-economic factors in census
  - Available only at household level for maternal deaths
- Allows multivariate analysis
  - Compares cases (maternal deaths) with controls (women who delivered in past 12 months and survived)

# Results: fertility and mortality

	Census, 2001	CS, 2007
Households	991,543	246,618
Fertility (CBR)	22.8	24.0
Mortality (CDR)	9.3	15.3
Male, ${}_{45}q_{15}$	440	606
Female, ${}_{45}q_{15}$	320	501

# Results: maternal mortality

	Census, 2001	CS, 2007
Nb maternal deaths	508	168
Percent time in maternal period	7.1%	7.6%
Proportion of maternal deaths	6.4%	4.3%
MMR / 100,000	542	702
95% CI	497-591	603-816

# Levels and trends in maternal mortality

## ■ Levels

- Abnormally high adult mortality (3 to 5 times that of model life tables with same  $e^{\circ}(60)$ )
- Due to chronic infections: HIV/AIDS and PTB
- And to external causes (accidents, violence)

## ■ Trends

- Increasing trend in adult mortality from 2001 to 2007
- Increasing trend in maternal mortality (+29%;  $P < 0.004$ )
- Decreasing proportion in maternal deaths



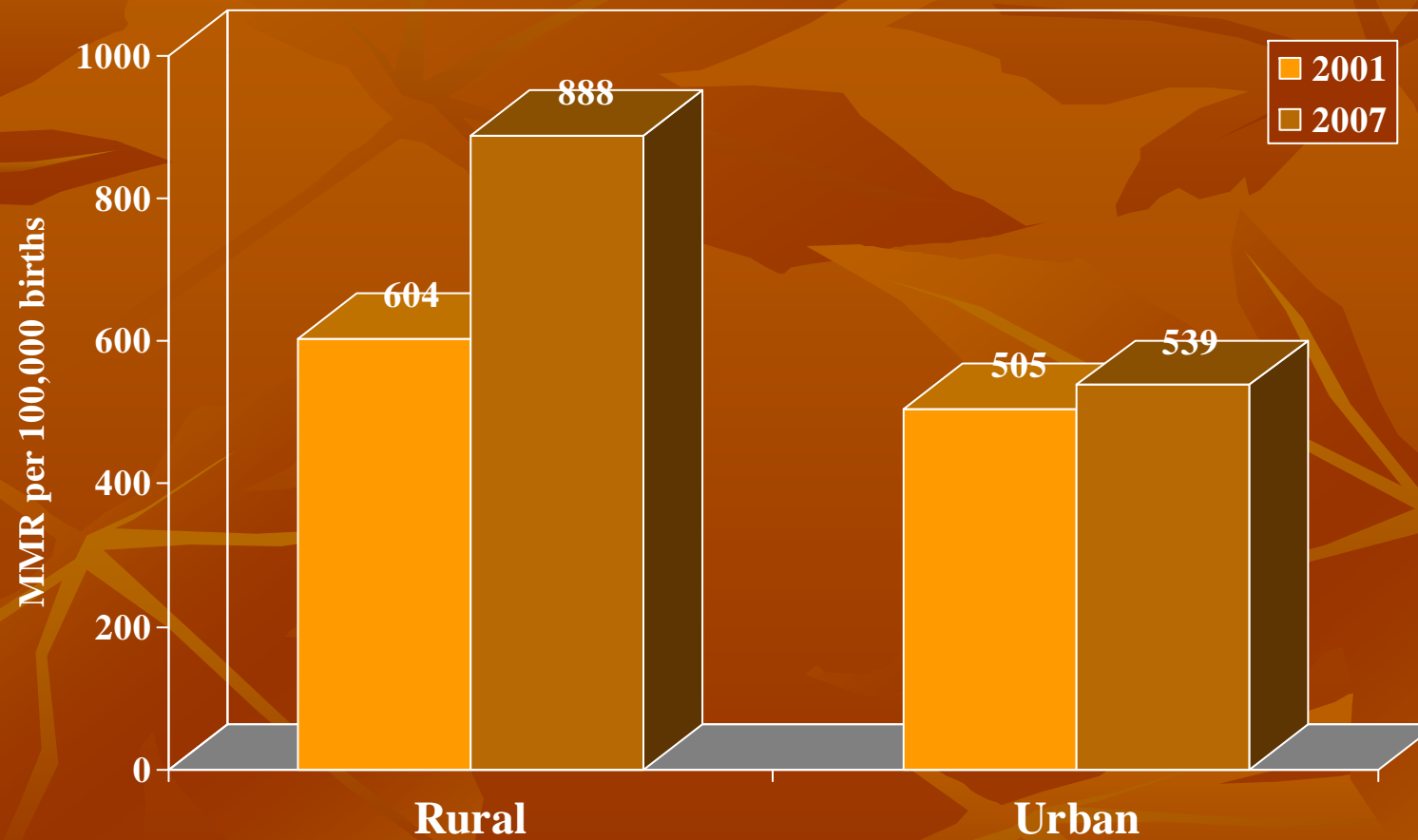
# Risk attributable to the maternal period

- Comparison
  - Deaths expected from mortality among non-pregnant women
  - Deaths during maternal period
- Attributable risk
  - Observed / Expected number of deaths
  - Census, 2001: AR= 0.69
  - Community Survey, 2007: AR= 0.57
  - No increased risk associated with pregnancy and delivery! (pregnancy and delivery are protective)
  - New situation, very different from pre-AIDS era, where AR = 1.5 to 2.0

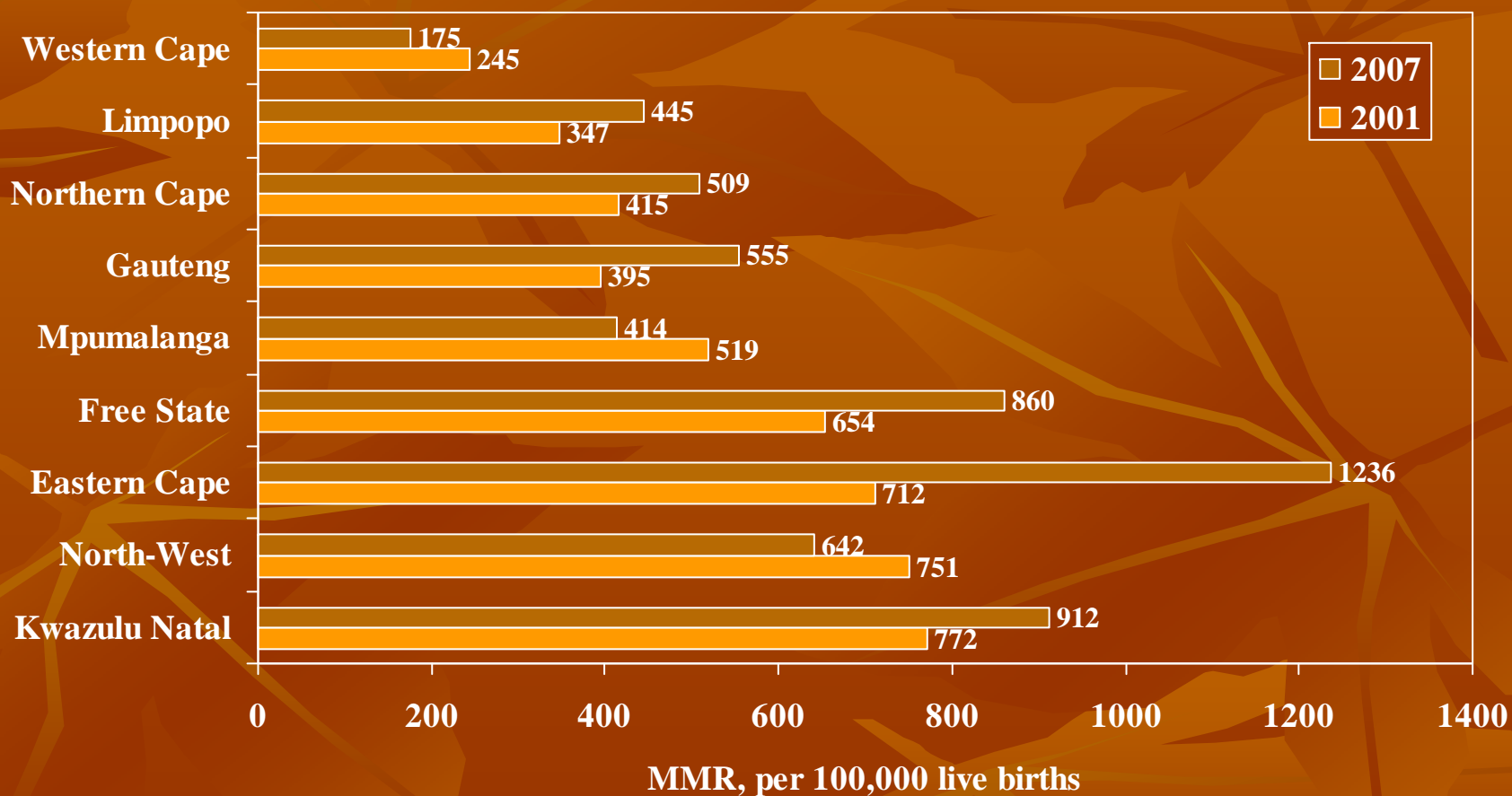
# Differential analysis

- Household characteristics / Socio-economic status
  - Urban / Rural
  - Province
  - Race
  - Education
  - Income
  - Wealth
- Community variables / Provincial level
  - HIV/AIDS prevalence
  - External causes
  - Home deliveries

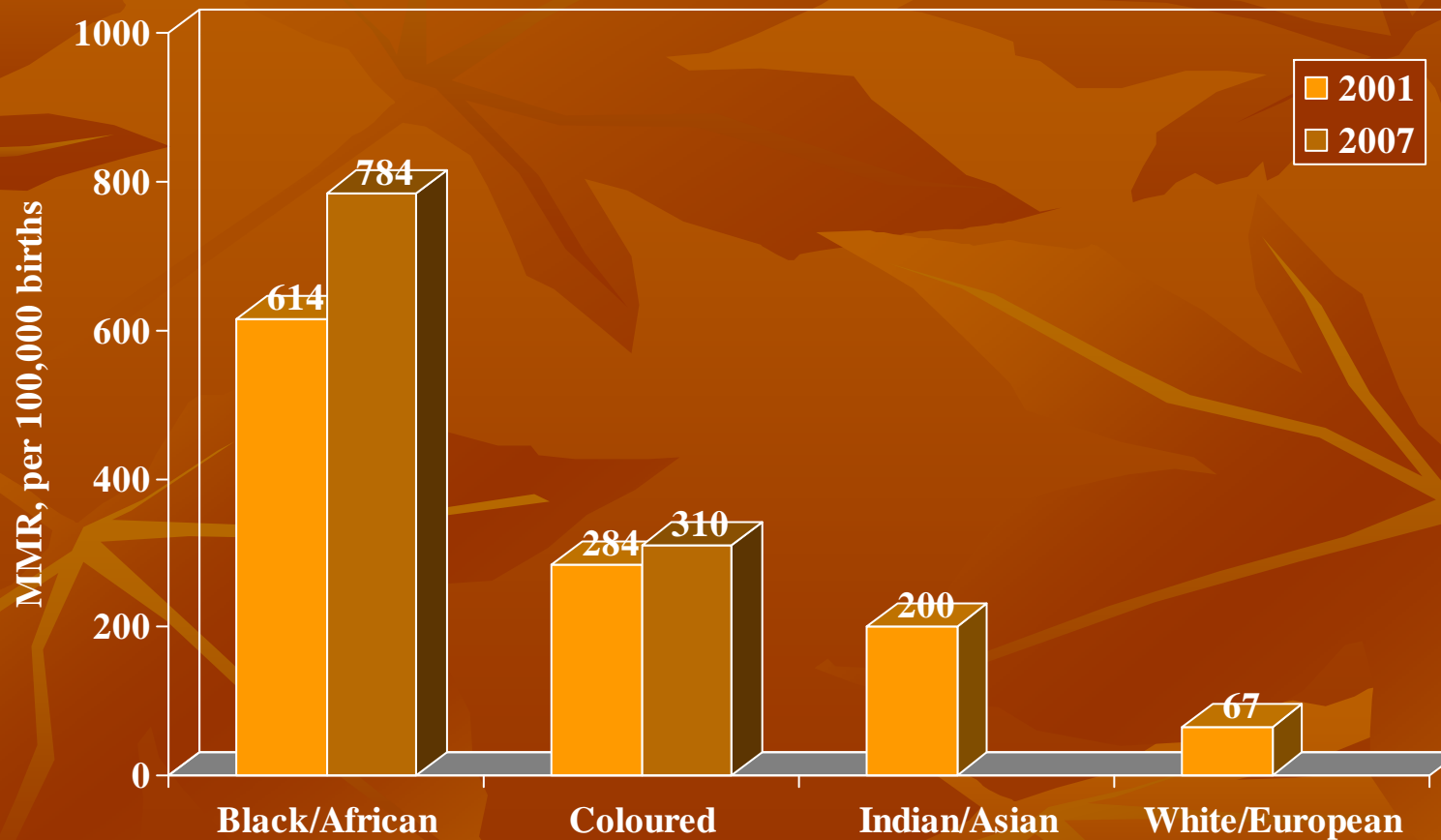
# MMR, by area of residence



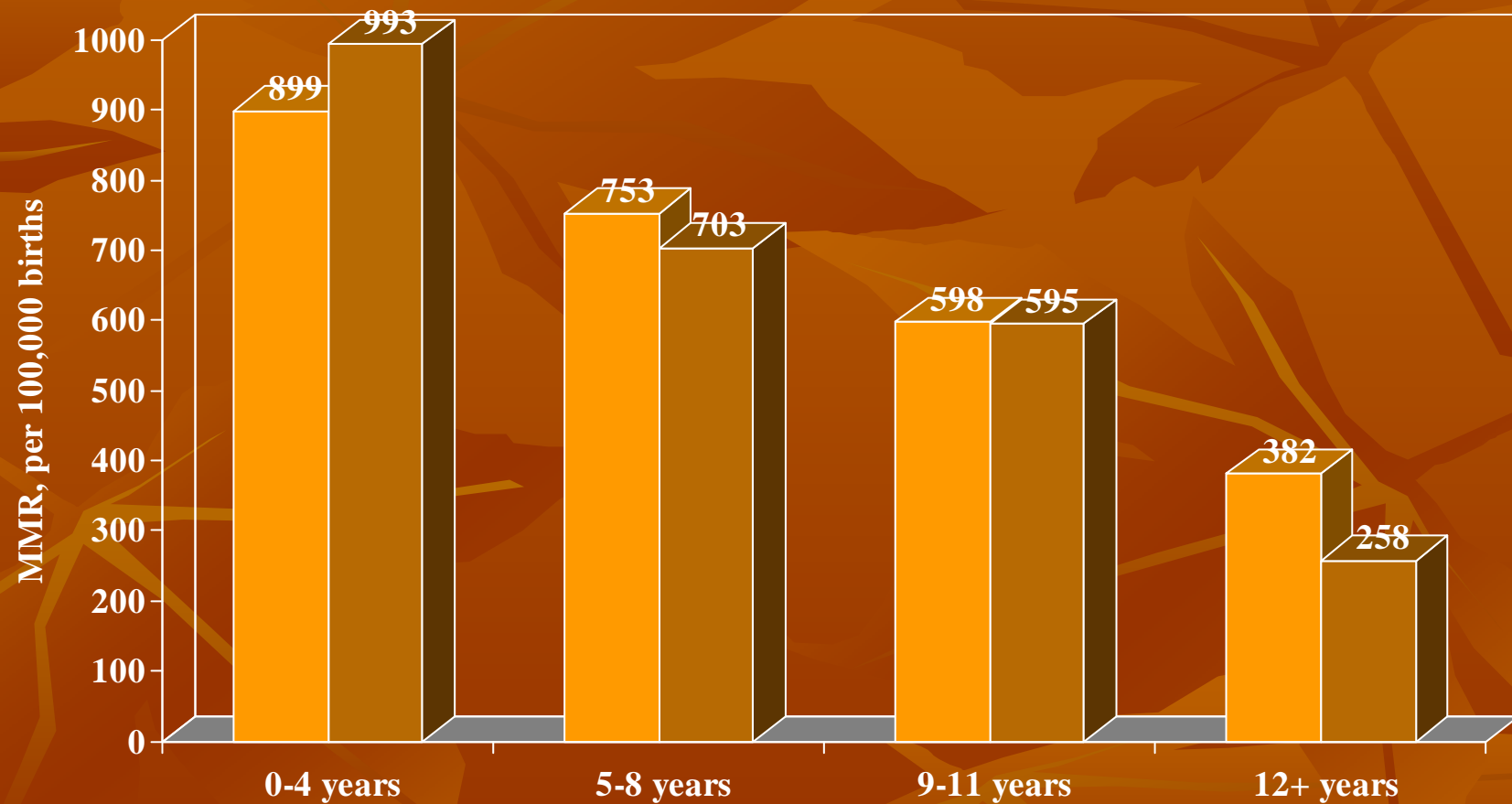
# MMR, by province of residence



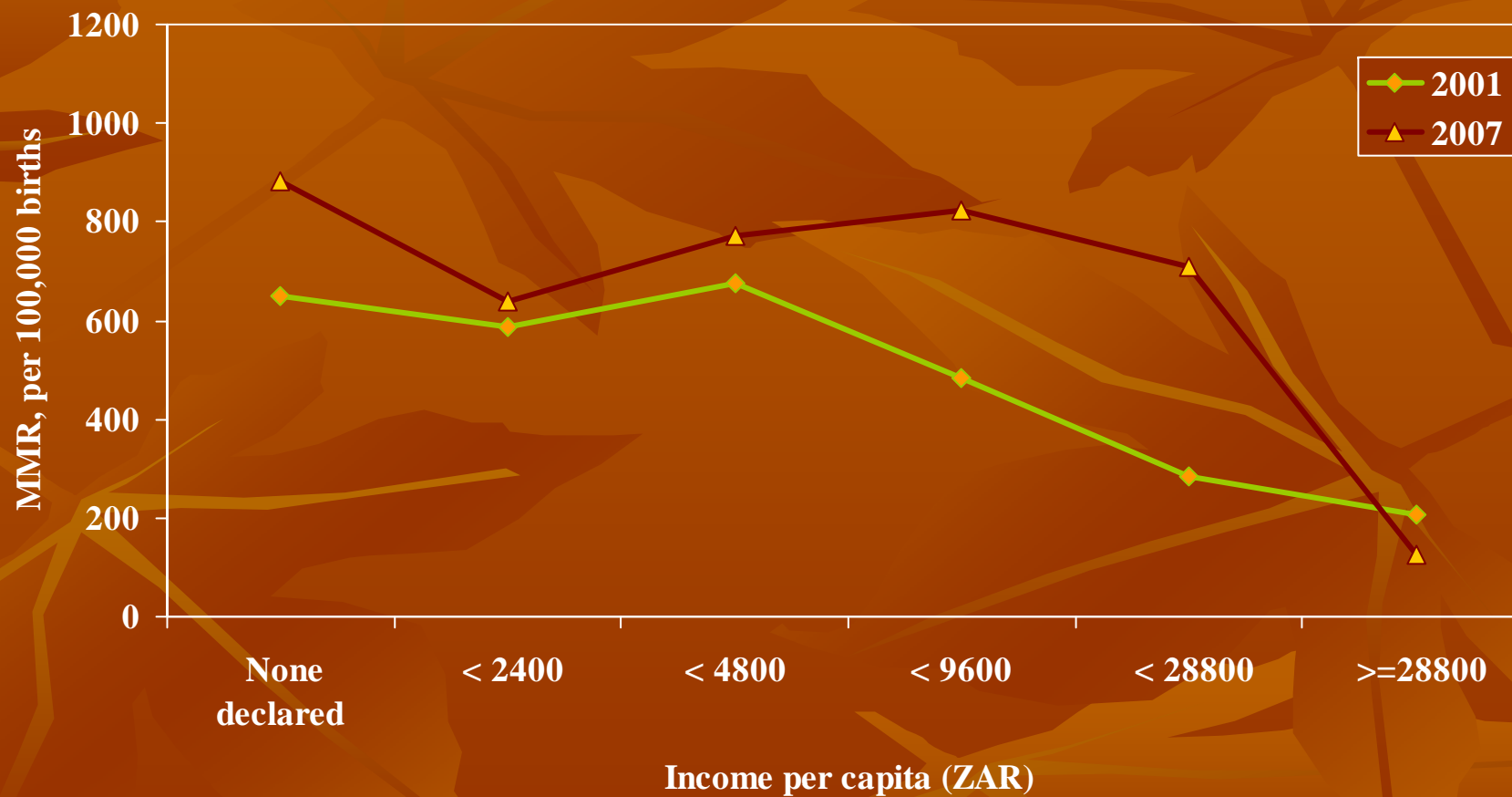
# MMR, by population group (race)



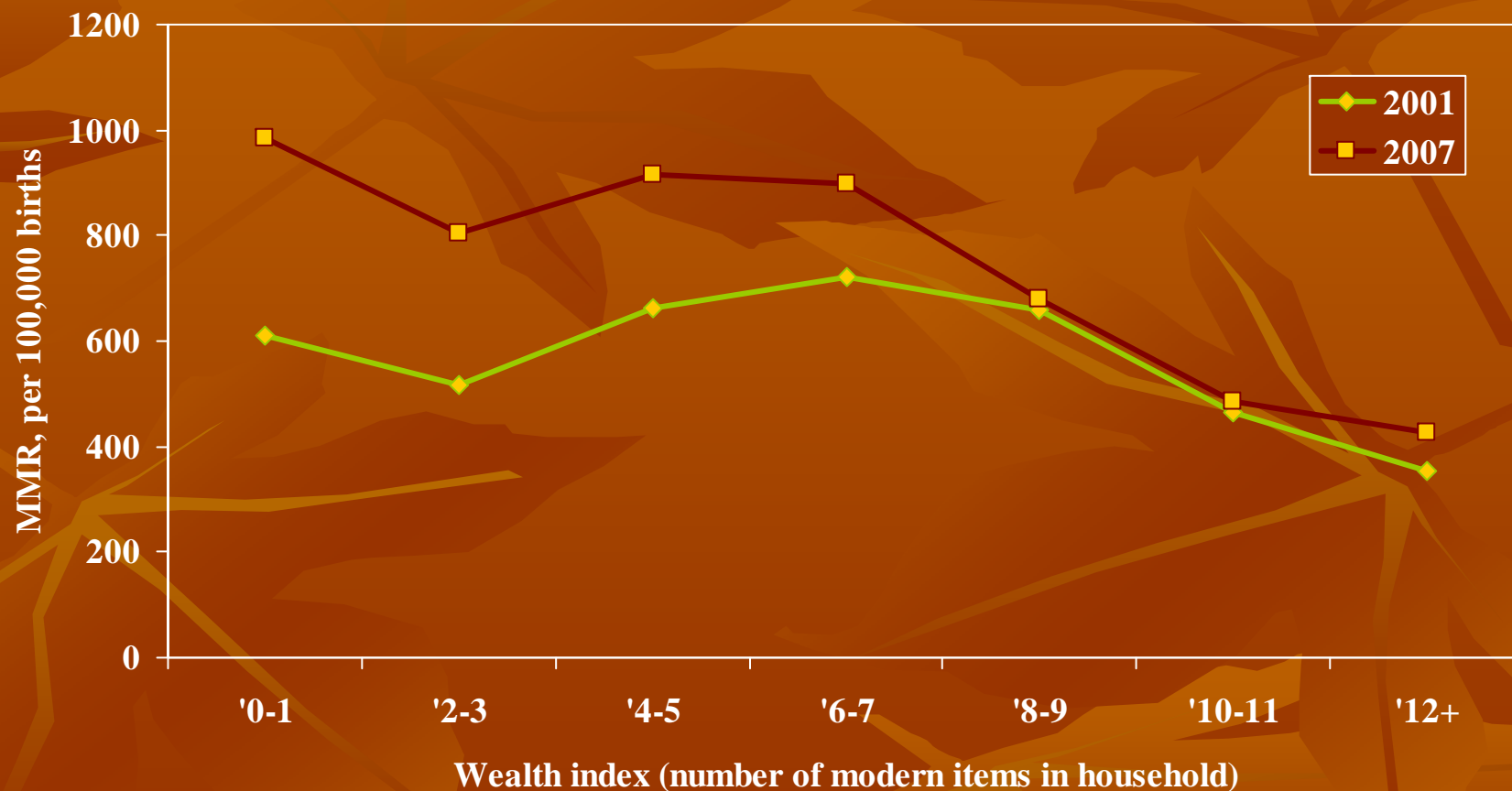
# MMR, by level of education



# MMR, by income per capita

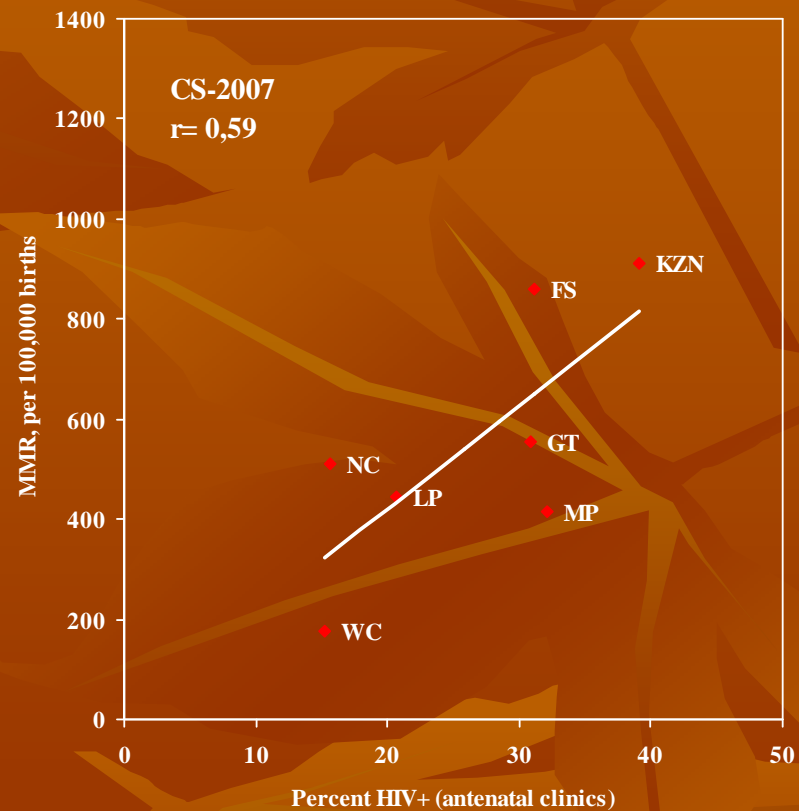
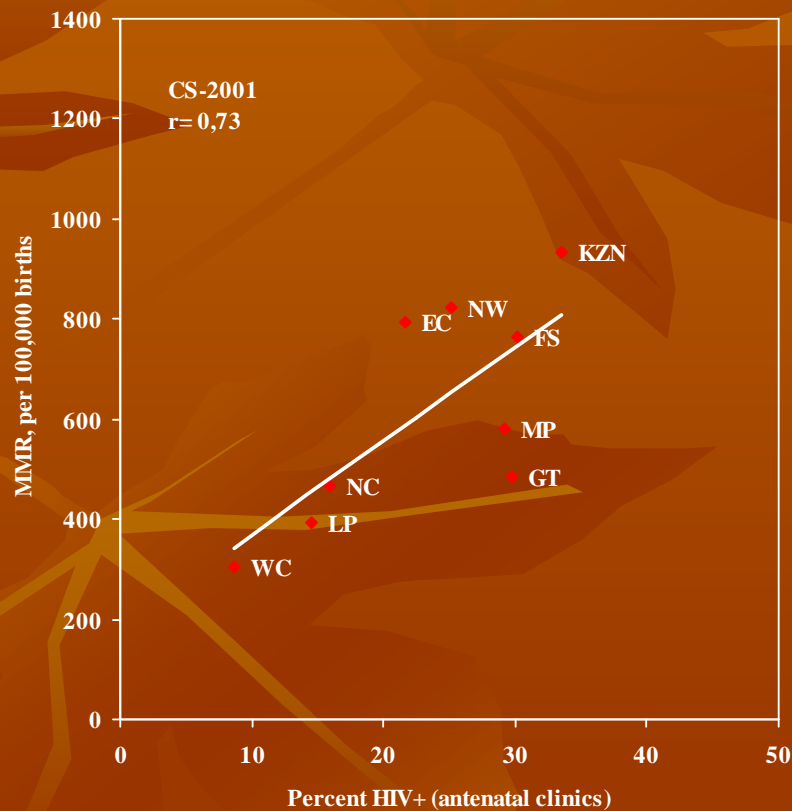


# MMR, by absolute wealth index

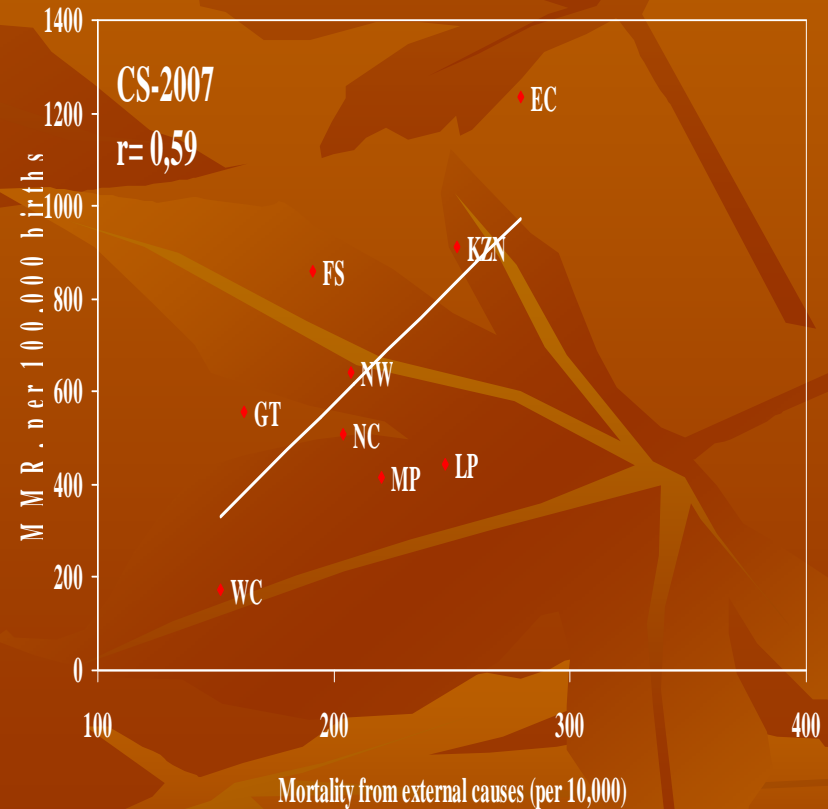
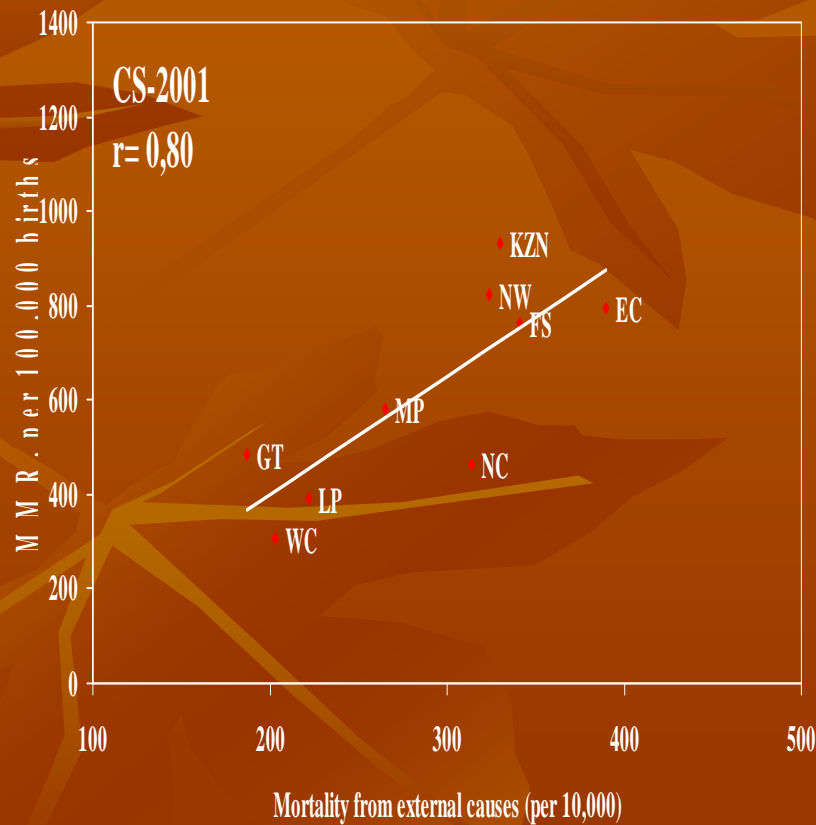




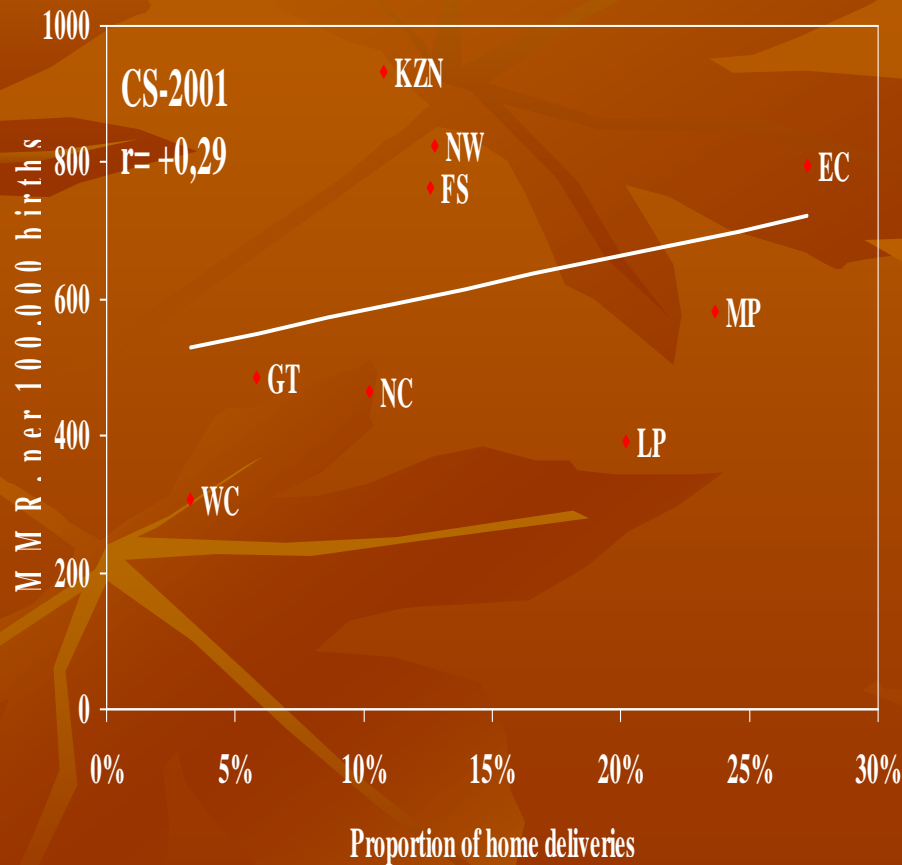
# MMR, by HIV prevalence provinces of South Africa



# MMR, by external cause mortality, provinces of South Africa



# MMR, by proportion of home deliveries, provinces of South Africa



# Conclusions (I)

- MMR much higher than previously thought
  - Consistent with findings from Agincourt (same MMR)
  - Still within the range of other countries in Africa
  - Unlikely to be over-estimated because of the low proportion of maternal deaths among women 15-49
- MMR has increased in recent years, due to HIV/AIDS & PTB, Accidents & Violence
  - Many hospital studies show a high proportion of maternal deaths due to HIV/AIDS or PTB
  - Evidence of increase in MMR in Cape Town peninsula
  - Evidence from the vital registration system

## Conclusions (II)

- Very pronounced maternal mortality differentials in South Africa
  - By race, ethnicity , province
  - Milder by level of education
- Complex relationship with income and wealth:
  - middle income / average wealth have the highest risks
  - Risks decline with distance from average, except for the poorest

# Conclusions (III)

- Potential of population censuses for maternal mortality:
  - Exhaustive and unbiased
  - Large number of deaths, and small confidence intervals
  - Potential for differential analysis
  - Potential for multivariate analysis at household level
- Can be much improved by providing more details on causes of maternal deaths:
  - Separate direct cause, indirect causes, external causes
  - Provide more details on timing of death (early pregnancy, late pregnancy, delivery, post-partum, post-abortion)
  - Question the actual “demographic” definition of MMR



South Africa, Rock Art