



# Greetings



**KLE University's**  
**Jawaharlal Nehru Medical College, Belgaum**





# Mapping mortality from Maternal Newborn Health Registry to improve pregnancy outcomes

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The Global Maternal Newborn Health Conference

Using Data Visualization to Improve Maternal and Newborn Health Outcomes

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# Outline of the presentation

- Objective of the Maternal Newborn Health Registry of NICHD Global Network for Women's and Children's Health Research
- Profile of the study area
- Data collection process
  - Household survey of Married Women of Reproductive Age
- Trends in maternal, perinatal and neonatal mortality– 2009 to 2014
- Lessons learned







# Maternal Newborn Health Registry May 2008 onwards

**‘Pregnancy Tracking System’** to quantify and understand the **trends in pregnancy outcomes** in defined low-resource geographic areas over time, in order to provide population based statistics on **stillbirths**, and **neonatal and maternal mortality**.

Goudar SS *et al* The Maternal and Newborn Health Registry Study of the Global Network for Women's and Children's Health Research. *Int J Gynaecol Obstet*. 2012 Sep;118(3):190-3







# Profile of MNH Clusters Belgaum & Bagalkote Districts, Karnataka, India

• Clusters	24
• Primary Health Centers	37
• Sub Centers	121
• Population	723,795
• Villages	242
• Anganwadis	768
• Accredited Social Health Activists (ASHAs)	522





# Annual Household Survey of Married Women of Reproductive Age

- Adapted from Household Reproductive and Child Health and Eligible Couple Survey of Ministry of Health, Govt. of India
- Conducted by Accredited Social Health Activist (ASHA) / Anganwadi workers, supervised by Auxiliary Nurse Midwife (ANM) and Registry Administrator (RA)
- Enrolling Married Women of Reproductive Age (MWRA)
- Identifying women that are
  - Currently pregnant
  - Unlikely to conceive
  - Likely to conceive
- Establish expected pregnancy rates for the clusters

**Establishment of a Maternal Newborn Health Registry in the Belgaum District of Karnataka, India. Kodkany B S, Derman R J, Honnungar NV et al. Reproductive Health 2015, 12(Suppl 2):S3**



# MWRA Survey Analyses: 2014

• Households	71,804
• Population	393,284 (5.50/household)
• MWRA	74,469 (189/1000)
• MWRA NOT likely to conceive	55,108 (74.00%)
• Tubal ligation	45,832 (61.56%)
• Sterility	4,850 (6.51%)
• Currently pregnant	4,426 (5.94%)
• Couple Protection Rate	61.55%
• MWRA likely to conceive	19,361 (26.00%)
• Expected pregnancies	8,852 (45.72%)







# Quality Monitoring Metrics

- **Pregnancy Outcomes**
  - Early (within 12 weeks of conception) registration of pregnancy to capture:
    - Miscarriage
    - Medical Termination of Pregnancy
  - Visit mother/baby within 48 hours of delivery
    - Confirm birthweight recorded in case records
    - Involve ASHA for reporting delivery
  - Monitor Gender ratio over time
- **Key Variables**
  - Maternal: Height, Weight and Hemoglobin
  - Newborn: Birthweight, Gestational age and Resuscitation practices

**Data quality monitoring and performance metrics of a prospective, population-based observational study of maternal and newborn health in low resource settings. Goudar S S, Stolka K B, Marion Koso-Thomas, Honnugar N V, Mastiholi S C et al**





# MNH Registry

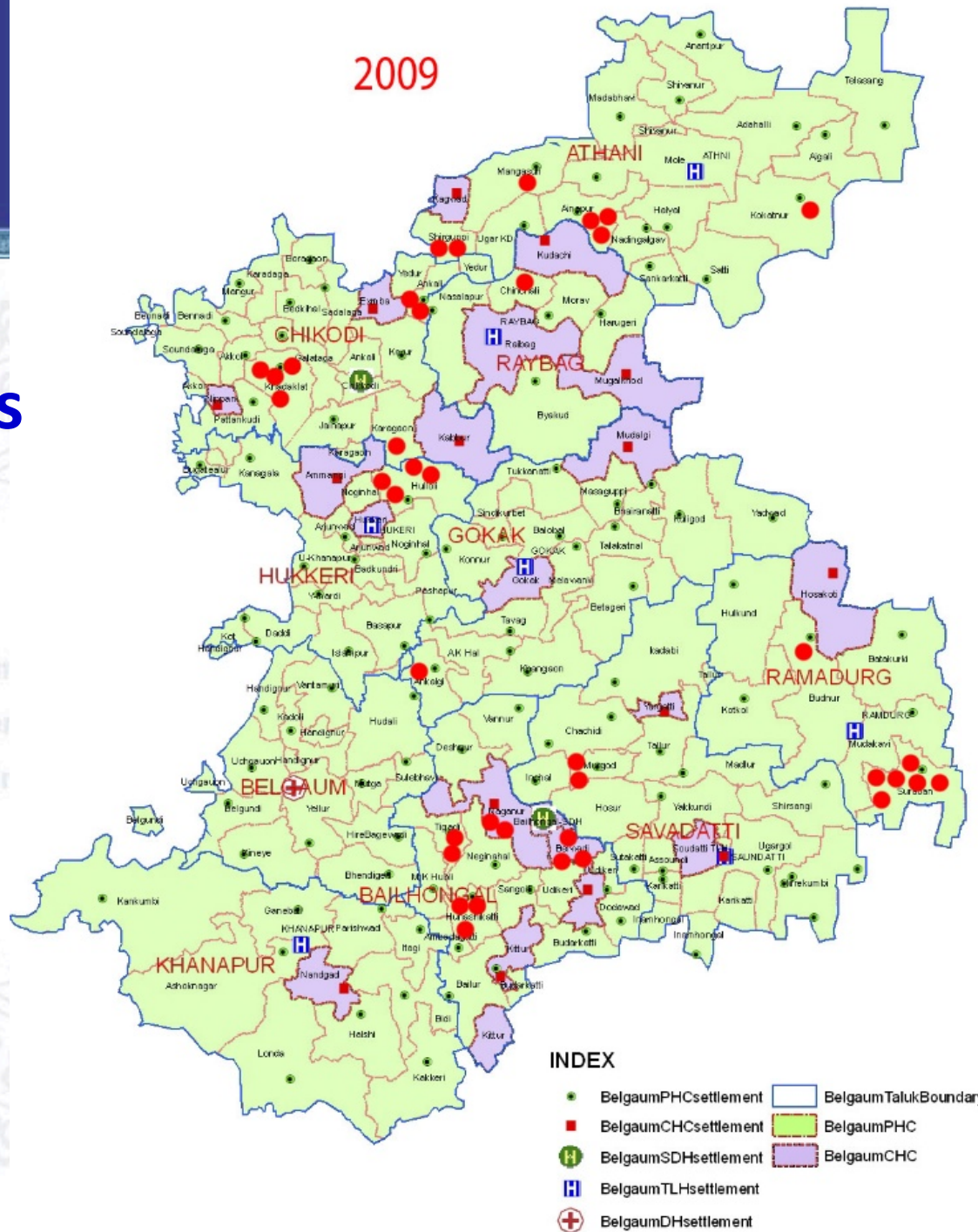
## May 2008 – August 2015

Pregnant women screened	<b>146,846</b>
Consented n (%)	<b>146,727 (99.9)</b>
Delivery n (% of expected)	<b>139,502 (~100)</b>
Follow up at 6 weeks postpartum n (% of expected)	<b>138,552 (~100)</b>
Maternal Mortality Ratio n (rate per 100,000 live births)	<b>172 (125)</b>
Perinatal Mortality Rate n (rate per 1,000 live births)	<b>5,997 (46.5)</b>
Early {7day} Neonatal Mortality Rate n (rate per 1,000 live births)	<b>2,498 (19.8)</b>
Neonatal {28 day} Mortality Rate n (rate per 1,000 live births)	<b>3,072 (24.3)</b>





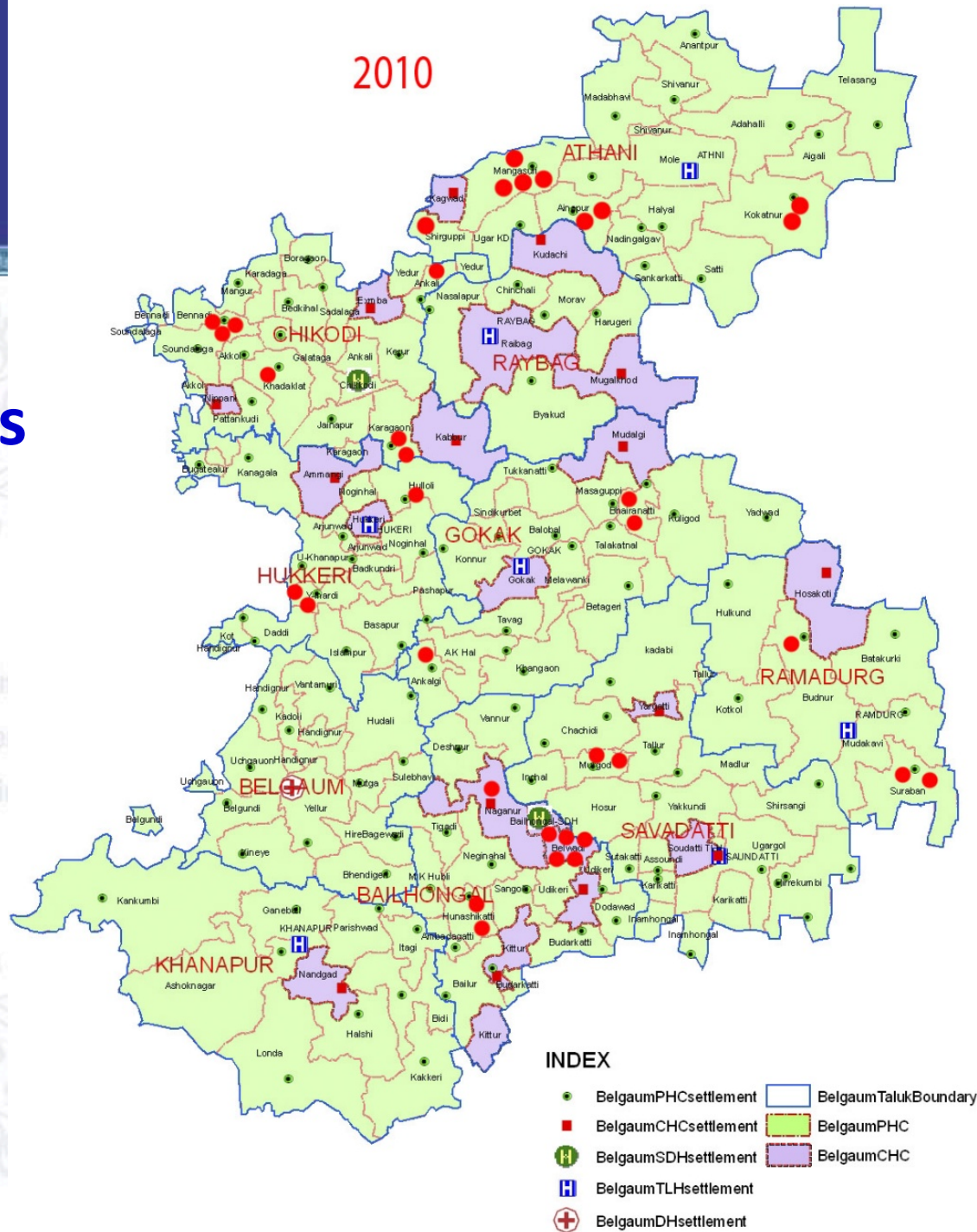
# Maternal Deaths & Public Health Facilities - Belgaum District 2009

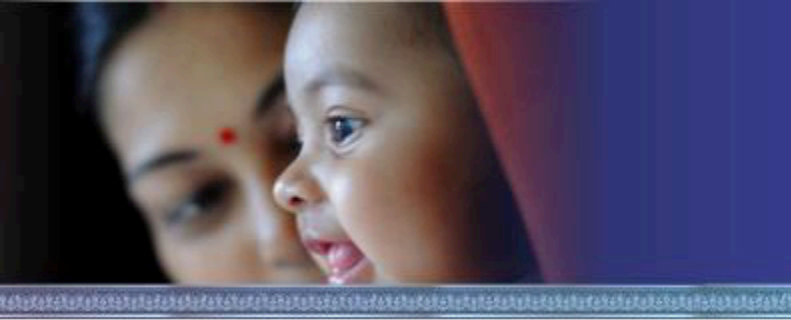




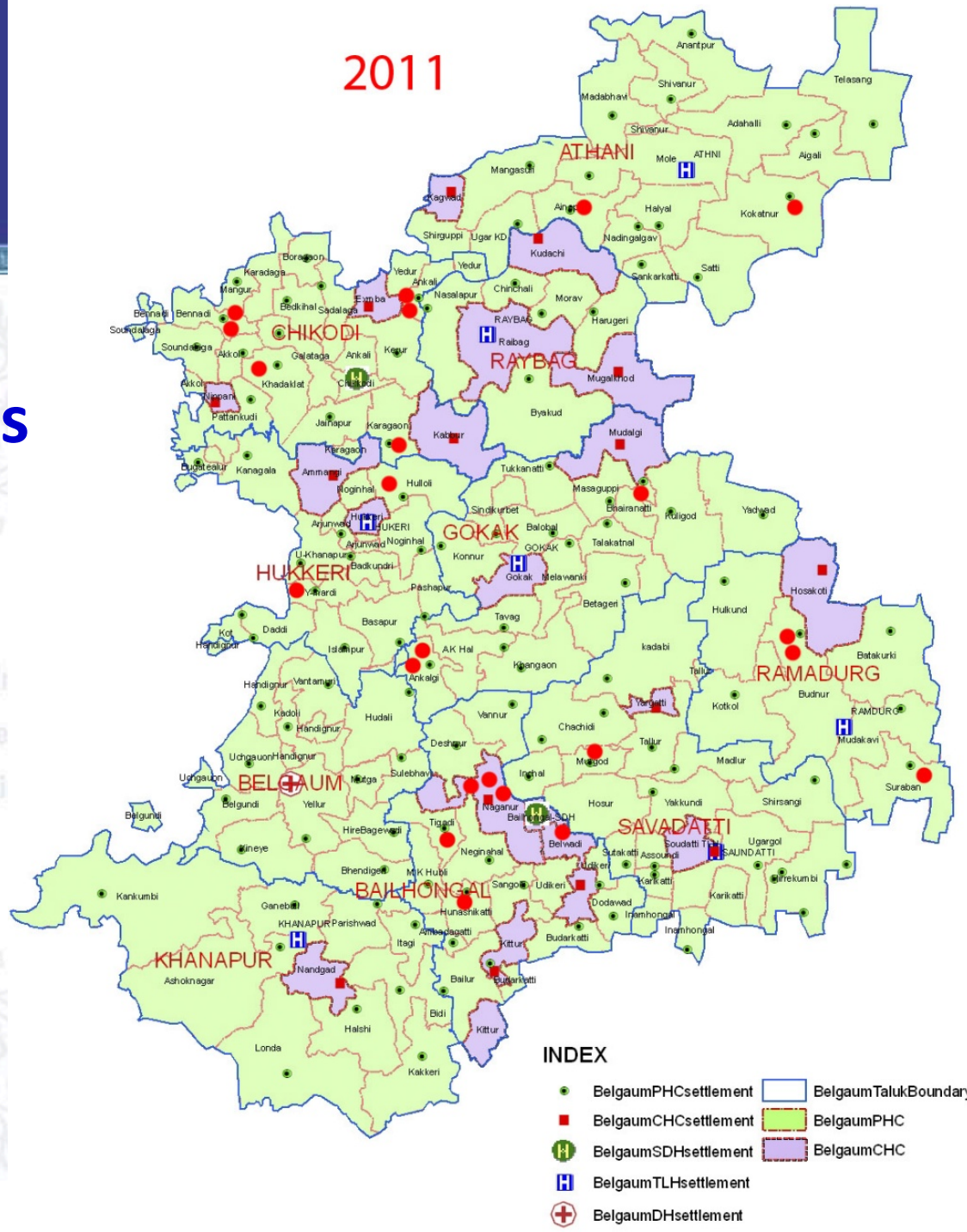


# Maternal Deaths & Public Health Facilities - Belgaum District 2010





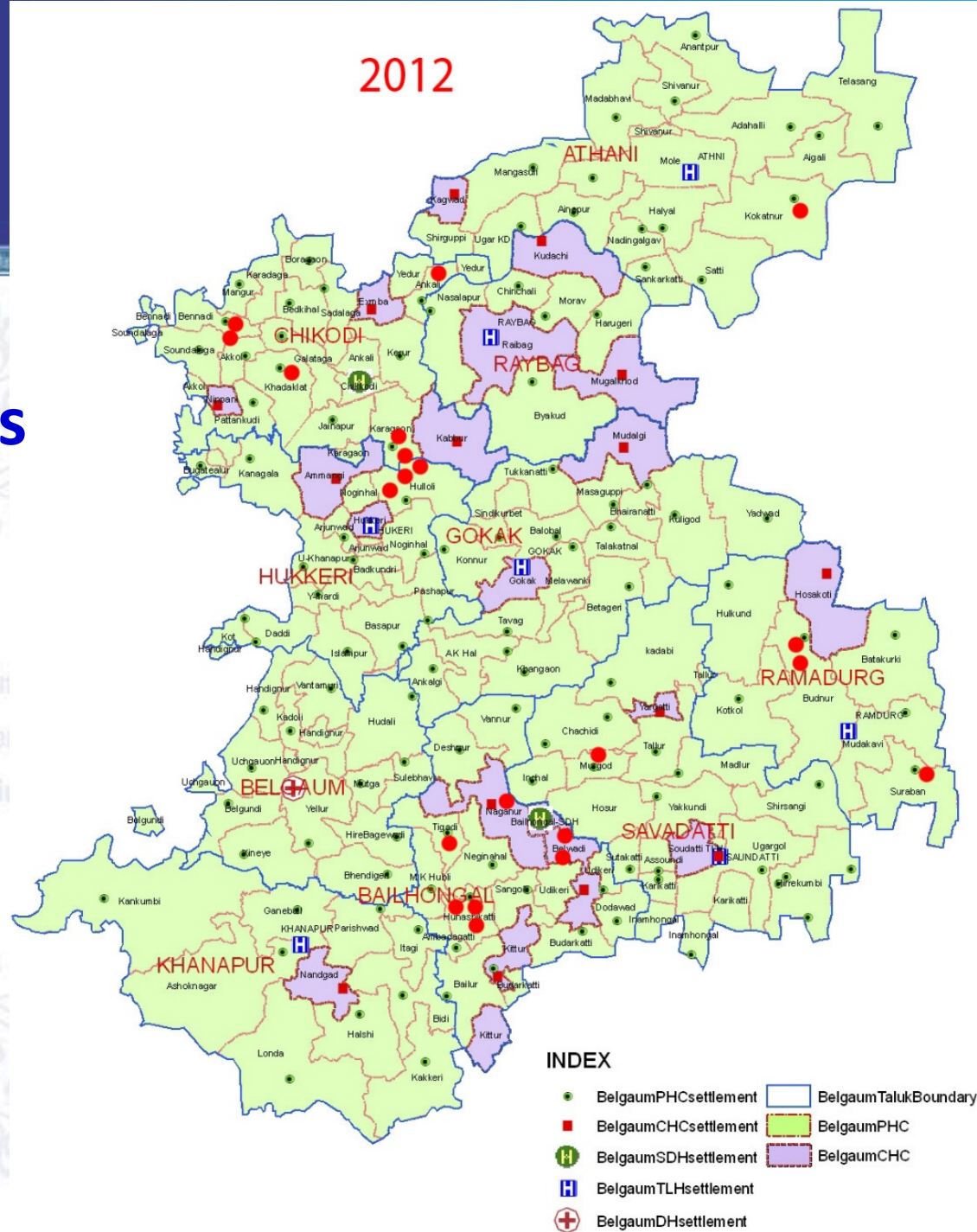
# Maternal Deaths & Public Health Facilities - Belgaum District 2011







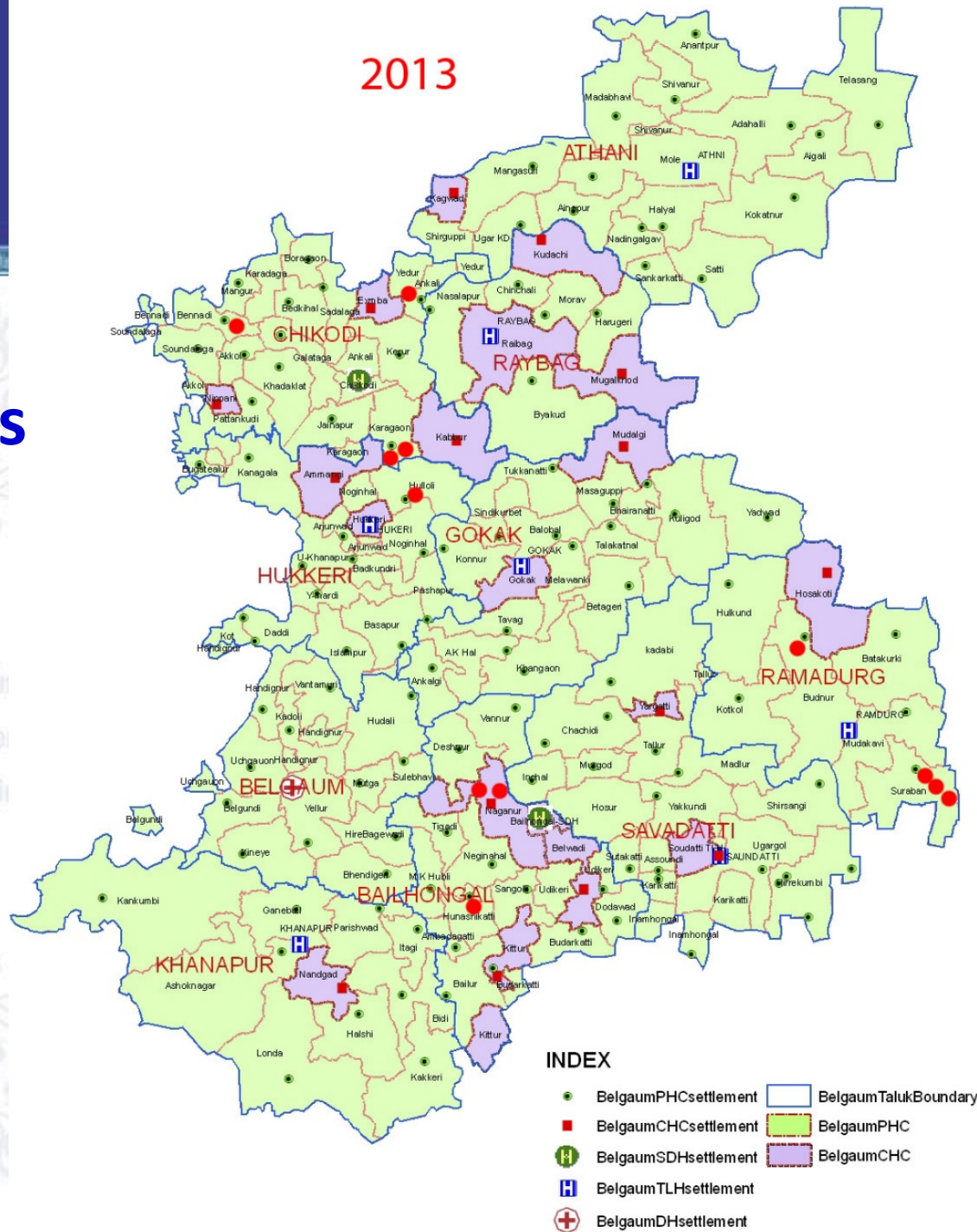
# Maternal Deaths & Public Health Facilities - Belgaum District 2012

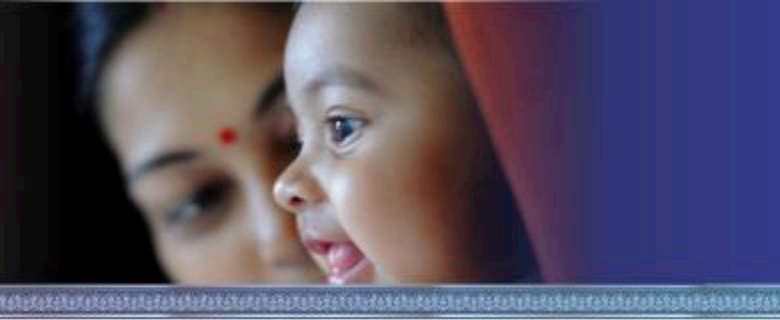




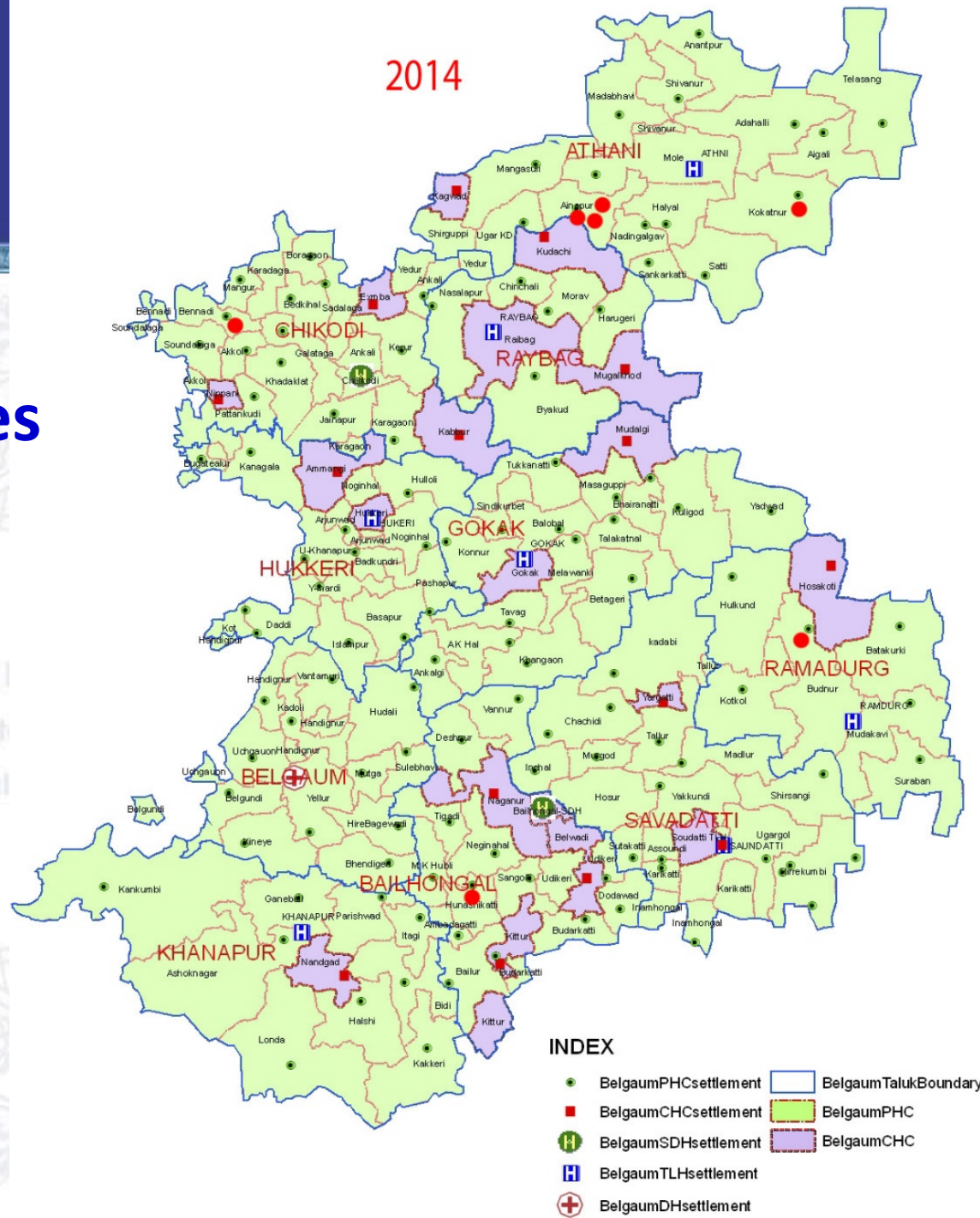


# Maternal Deaths & Public Health Facilities - Belgaum District 2013





# Maternal Deaths & Public Health Facilities - Belgaum District 2014





# Mortality Trends

	2009	2010	2011	2012	2013	2014
Maternal Mortality Ratio (rate per 100,000 live births)	34 <b>(228)</b>	25 <b>(155)</b>	23 <b>(138)</b>	19 <b>(111)</b>	13 <b>(83)</b>	9 <b>(110)</b>
Perinatal Mortality Rate (rate per 1,000 live births)	704 <b>(46.0)</b>	681 <b>(41.4)</b>	661 <b>(38.8)</b>	669 <b>(38.2)</b>	533 <b>(33.4)</b>	271 <b>(32.6)</b>
Early {7day} Neonatal Mortality Rate (rate per 1,000 live births)	312 <b>(20.9)</b>	310 <b>(19.3)</b>	307 <b>(18.4)</b>	310 <b>(18.1)</b>	285 <b>(18.1)</b>	152 <b>(18.6)</b>
Neonatal {28 day} Mortality Rate (rate per 1,000 live births)	388 <b>(26.0)</b>	390 <b>(24.3)</b>	376 <b>(22.6)</b>	368 <b>(21.5)</b>	365 <b>(23.2)</b>	179 <b>(21.9)</b>







# Utility of a perinatal registry

- Provides population based indicators of adverse pregnancy outcomes, associated risk factors and trends over time
- Permits assessment of maternal and newborn care practices in communities and facilities
- Helps plan interventions to address mortality/morbidity unique to sites
- Enables capturing the perinatal outcomes of Cluster Randomized Trials, pre-post studies, programmatic intervention, and changes in health care policy





# Utility of maternal mortality maps

- Assess distribution of maternal deaths in geographical areas and their relationship to health facilities
- Monitor trends of adverse pregnancy outcomes over time
- Plan strengthening of health care services for reducing maternal mortality



# Lessons Learned

- Simplify annual household surveys to identify women who are “likely to conceive” and target services at preconception period
- Limit data collection to key variables to ensure quality
- Regular monitoring, supportive supervision and periodic refresher training are essential to sustain accuracy of data
- Incentivize ASHAs and CHWs for early registration of pregnancies and tracking the outcomes



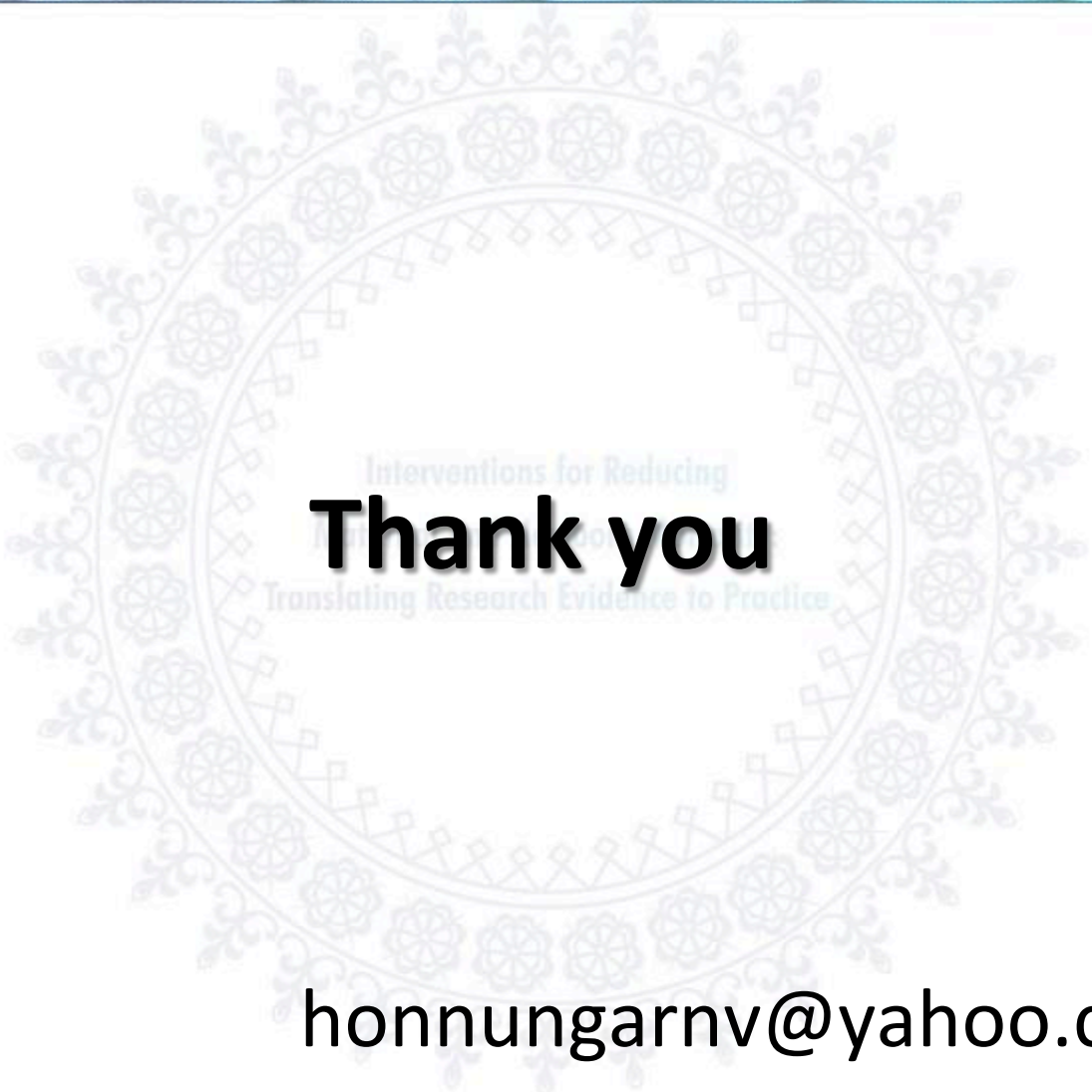




# Lessons Learned

- Encourage health workers to capture and report adverse pregnancy outcomes honestly and accurately
- Maternal Newborn Health Registry model could form the basis for a national vital registry system
- The processes employed could be adopted to strengthen Mother Child Tracking System





**Thank you**

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