Target intervention to increase measles vaccination coverage by identifying low-coverage areas using LoQ Assurance Sampling, Chennai, India, 2012

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Background
- Measles kills 400 people every day and 90% of them being children.
- All deaths occur every hour due to measles.
- Five measles vaccine coverage in Chennai is 99% based on latest reports.
- In Chennai from 2009-2011 nearly 11,32 cases reported of (52% of the state average).
- There were 20 outbreaks reported (4% of the state average) and 13 outbreaks were dealt individually.
- 12 deaths due to measles outbreaks, of which 1 death reported in 2009, 3 deaths reported in 2010 and 6 deaths in 2011.
- Prevention of measles deaths is key to achieve millennium development goal 4, that is reduce under-five mortality by two-thirds by 2015.

Objective
- To identify low immunization coverage areas by LoQAS technique.
- Estimate overall measles vaccine coverage.
- To identify the strength and weakness in the programme and make feasible recommendations.

Methods
- Study design: Cross sectional survey.
- Study population: All children of 12-23 months of age.
- Sampling process: LoQ assurance sampling (LoQAS).
- LoQAS: Hypotheses and sample size.
- Calculating Lm: Geographical areas where immunization activity is supervised by a health care facility.
- No of Lots: 10 lots.
- Hypotheses: Threshold value.
- LI: Immunization Coverage < 50% (Low).
- LC: Immunization Coverage 50% (High).
- Threshold value of not immmunized children: 10% (P1) and 5% (P2) e = 0.05 (accepting a bad test) & B = 0.1 (rejecting a good lots).
- Need to survey 37 children per lot with a decision value of 0.2 in each lot.
- Lcmotorb and Tuber: Simple stage sampling plan table 2C.
- Case definition.
- Fully immunized: 3 doses BCG, 3 doses OPV, 3 doses one polo & 2 dose measles (9-12 months) under one year.
- Measles Immunization: Immunization was undertaken after completion of nine months but before completion of 12 months.
- Data collection.
- Principal investigator and trained volunteers.
- Vaccination card and; parents record of vaccination history.
- Structured questionnaires (District household surveys).
- Nested from a randomly selected Ward & household within a lot.
- Retrieved 37/12 children survey.
- Analysis plan.
- Accept or reject null hypothesis based on decision value.
- Full immunization & coverage by vaccine with 95% confidence intervals.
- Vaccine spotting and stratified analysis.

Results
- LIQAS detected areas of low coverage.
- Percentage Delay in Immunization, Chennai, 2012,(n=150).
- Zones having low measles vaccine coverage.

Conclusion
- Weakness of immunization performance.
- Quantity: Persistence of low coverage areas.
- Quality: Poor maintenance of vaccine spacing.
- Vaccination coverage gap between estimated pooled coverage and reported full immunization.
- Recommendation.
- Targeted Intervention.
- Map-up immunization in pockets of low coverage.
- Increasing the number of health personnel in areas of low coverage.
- Mobilization of health workers to vaccinate drop-out children and Maintenance of proper vaccine spacing.
- Micro-planning for Outreach activities implemented in all health posts.
- Supervision should be reviewed monthly.
- Resource situation.
- In line as of low coverage.

Public Health Action Taken
- Report shared with District family welfare medical officer and Surveillance medical officer (National Polio Surveillance Project).
- Map: Immunization of non immunized children in areas of low coverage done.
- Childhood of migrant workers given immunization card and status of Immunization updated.
- Supervisory register in all health post.

Limitation
- Lack of data for both children & household Homogeneous list.
- Selected by random selection of first stum & first household.
- Prevention of bias on vaccination of the child was verified using.
- Vaccination history; cross verified with local calendar / Notepad / microscopic events.