

Trends in Under-five Mortality in Nepal in relation to coverage of important health interventions

A secondary data analysis NDHS reports

(MPH Capstone Project)

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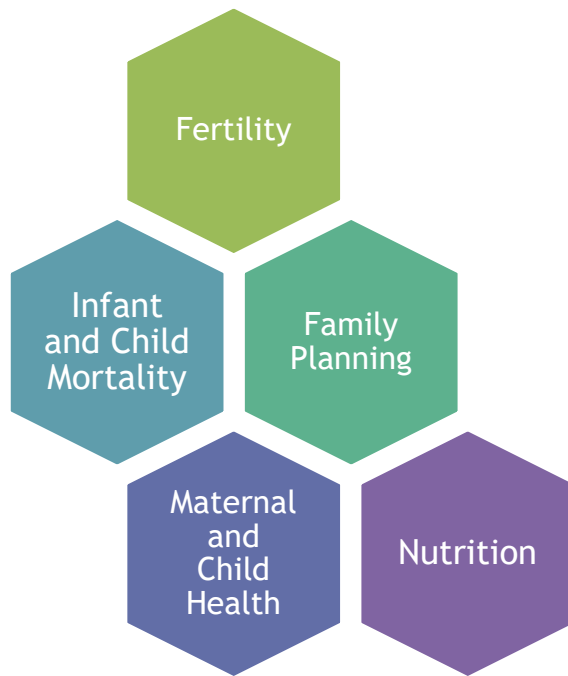
Outline

- Introduction
- Objectives
- Methodology
 - Analysis Plan
- Literature Review
- Results
- Discussion
- Conclusion
- References

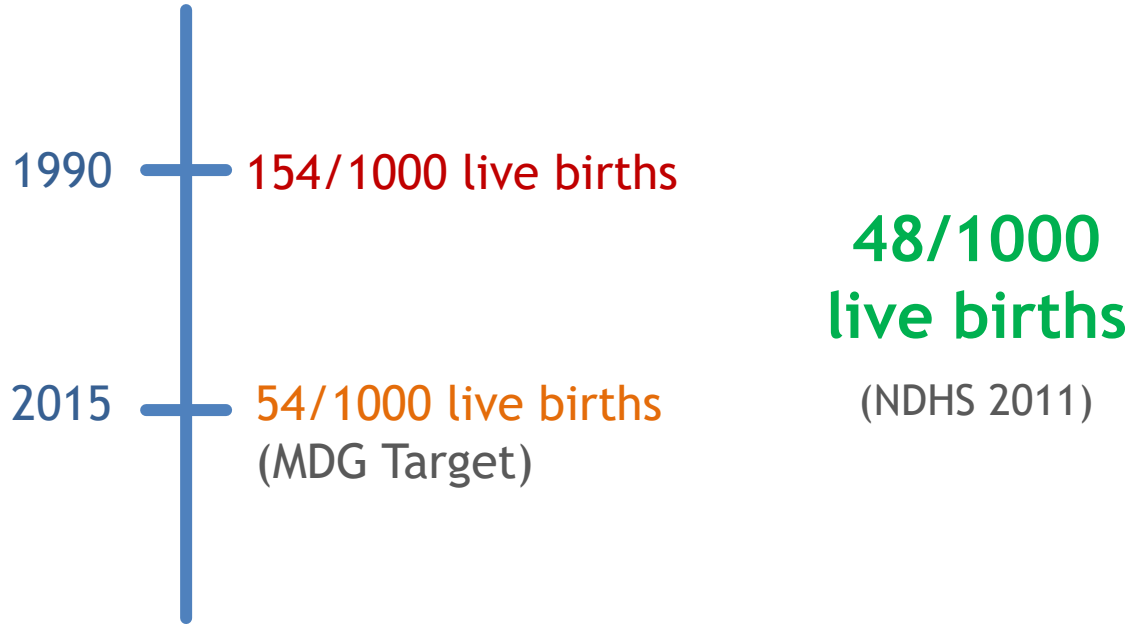
Introduction

Nepal Demographic Health Survey (NDHS)

- Every five years since 1996



State of U5MR in Nepal



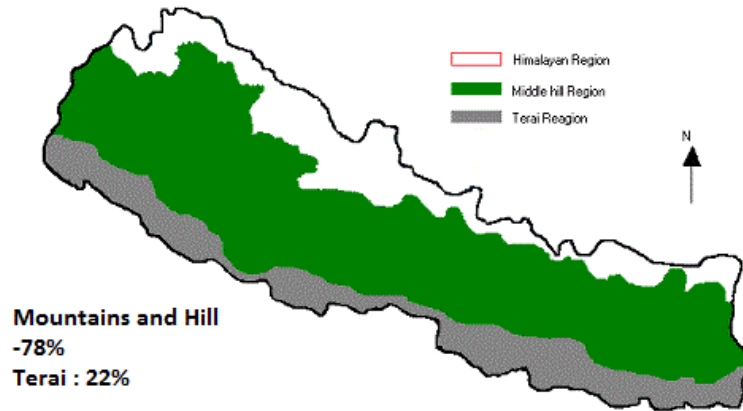
Child survival programs in Nepal

- ▶ Expanded Program on Immunization (EPI)
- ▶ Community-Based Integrated Management of Childhood Illnesses (CB-IMCI) program.

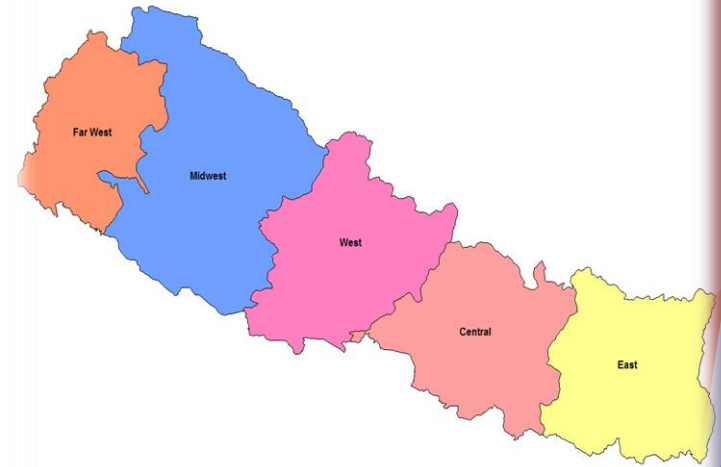
Comparison for U5MR due to diarrhea, pneumonia and measles during 1990 - 2015

Year	Mortality due to diarrhea	Mortality due to pneumonia	Mortality due to measles	Mortality due to pneumonia and diarrhea at the same time	Total deaths due to diarrhea, measles and pneumonia	Source
1991	17.1%	17.5%	2.3%	5.4%	42.3%	Lancet Pandey MR et al, 1991
2010	14%	10%	0%		24%	Unicef Nepal profile, 2010

Nepal Map - Subnational Divisions



Ecological Division



Developmental Division

Objectives

Objectives

- ▶ To compare coverage and assess changes in percentage in important child survival interventions
- ▶ To demonstrate association between U5MR and coverage of child survival interventions by residence (Urban/Rural)

Methodology

Methodology

- **Study design:** Descriptive study on trends of coverage and U5MR from data extracted from serial NDHS surveys

Methodology contd...)

- ▶ Nationwide data on U5MR and coverage of selected child survival interventions were abstracted from the demographic and health surveys



NDHS Data

Variables selected for study

Selected child survival interventions

Complete vaccination

Fever treatment at health facility/ from provider

Oral rehydration therapy for treatment of diarrhea.

Socio ecological variables

Level of mother's education

Ecological regions

Developmental regions

Analysis Plan

$$\% \text{ change in coverage} = \frac{\text{Mean}(Y) - \text{Mean}(X) \times 100}{\text{No. of years between two surveys} \times \text{Mean}(X)}$$

Mean (Y) = Average coverage (in %) across all levels of socio ecological variables in a NDHS survey (2001 / 2006 / 2011)

Mean (X) = Average coverage (in %) across all levels of socio ecological variables in NDHS survey - 1996

No. of years = Difference in years between two surveys

Analysis Plan (contd...)

$$\% \text{ change in U5MR} = \frac{\text{Mean of (B)} - \text{Mean of (A)} * 100}{\text{No. of years between surveys} * \text{Mean of (B)}}$$

Mean of (A) = Average U5MR across all levels of socio ecological variables in a NDHS survey (2001 / 2006 / 2011)

Mean of (B) = Average U5MR across all levels of socio ecological variables in NDHS survey - 1996

No. of years = Difference of years between two surveys

Analysis Plan (contd...)

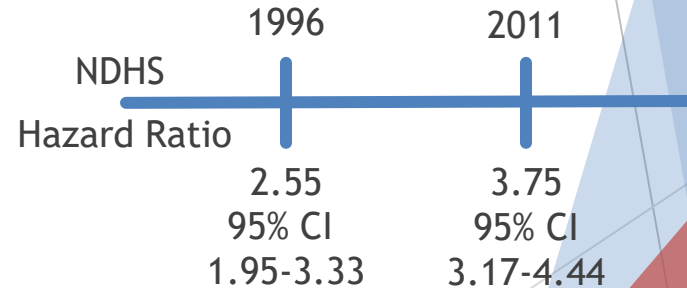
- Association between rural and urban coverage of child survival interventions with urban and rural U5MR was shown by Pearson correlation test with significance of test set at $p\text{-value} < 0.05$

Literature Review

Literature review

Sreeram Reddy et al

- Inequalities existed in U5MR in Nepal when it was stratified by mother's education and different ecological and developmental regions.
- Mother's Education Hazard Ratio
(Higher Education vs No Education)
- Changes in regional inequities were marginal and irregular.



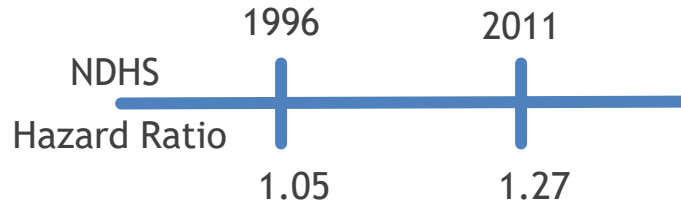
Literature review (contd..)

- In another study by Sreeram Reddy et al,
 - Total family income
 - Number of symptoms
 - Mothers' education
 - Perceived severity of illnesswere the predictors of care seeking behavior of mother

Literature review (contd...)

Sreeram Reddy et al

- Variation in U5MR (Rural vs Urban)



Literature review (contd...)

Singh PK et al

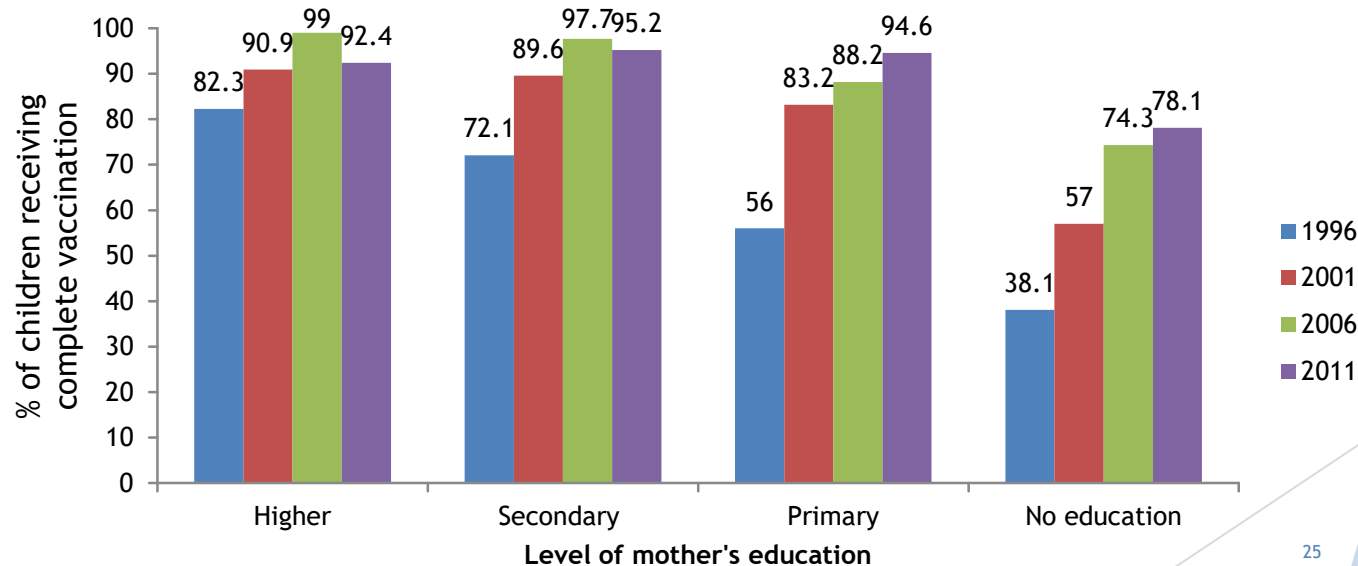
- A study in India across six major geographical regions on coverage of vaccination showed urban-rural inequality increased in the west region during 1992-2006.

Results

Comparison of coverage with socio-ecological variable

Figure No.	Disease Intervention Coverage		Socio-ecological variable
1	Complete vaccination	vs	mother's education
2		vs	developmental region
3		vs	ecological region
4	Fever in two weeks preceding the survey and who sought treatment	vs	mother's education
5		vs	developmental region
6		vs	ecological region
7	ORT coverage	vs	mother's education
8		vs	developmental region
9		vs	ecological region

Figure 1. Percentage of children 12-23 months who received complete vaccination by mother's education

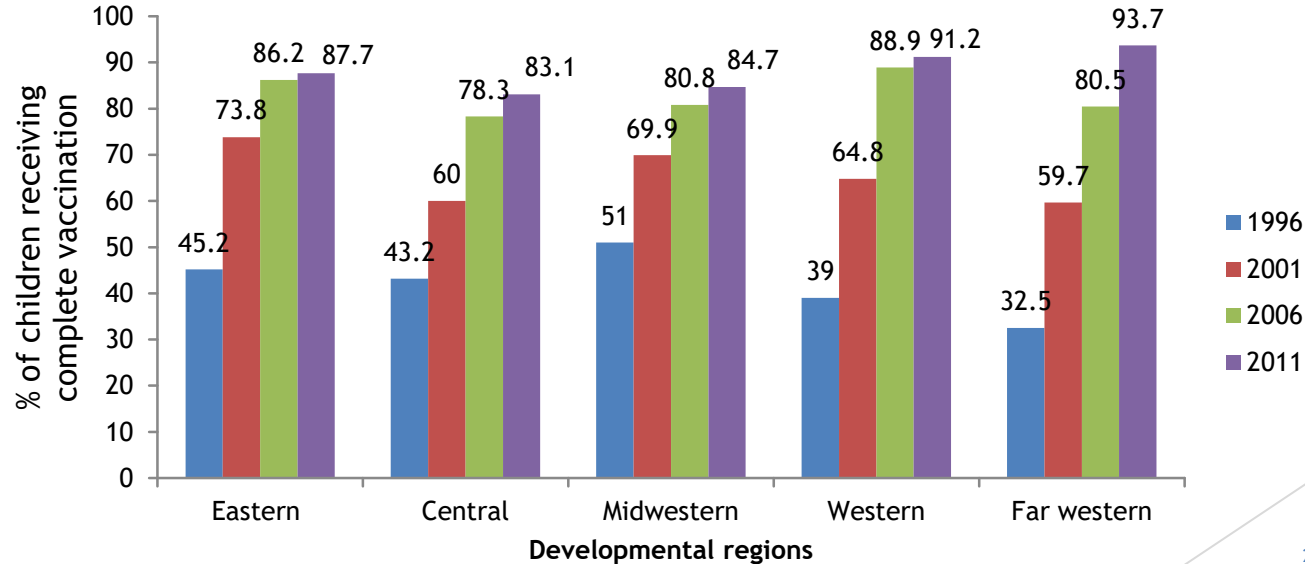


Vaccination
vs Mother's Ed.
vs Dvlpmntl Rgn.
vs Ecological Rgn.

Fever
vs Mother's Ed.
vs Dvlpmntl Rgn.
vs Ecological Rgn.

ORT
vs Mother's Ed.
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vs Ecological Rgn.

Figure 2. Percentage of children 12-23 months who received complete vaccination by developmental region

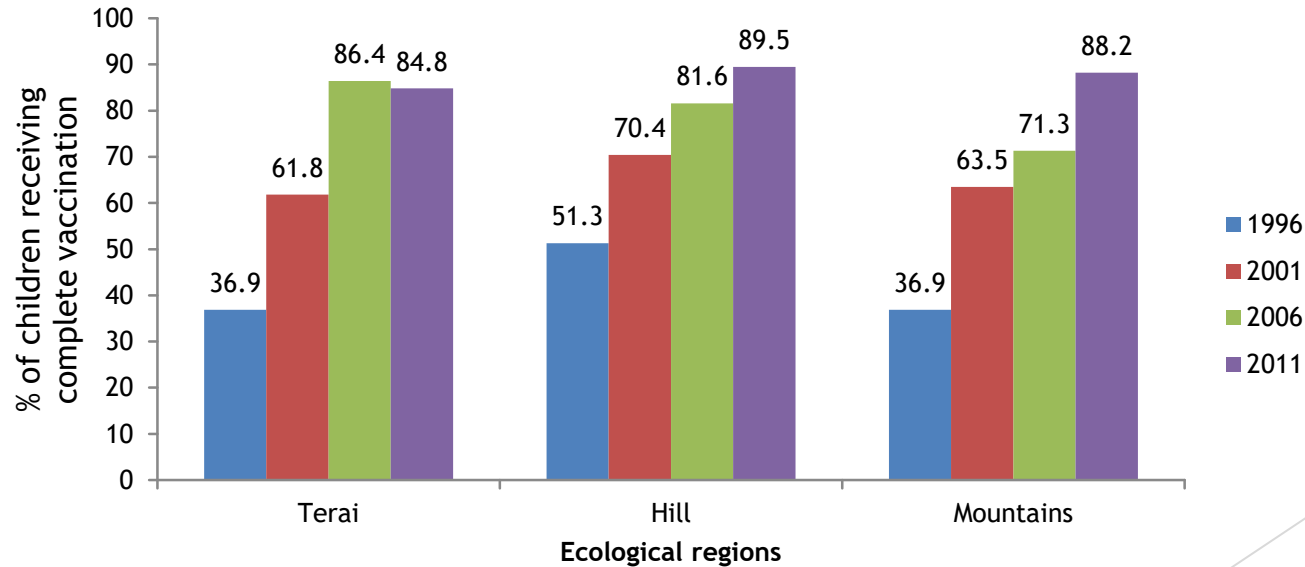


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Figure 3. Percentage of children who received complete vaccination by ecological region

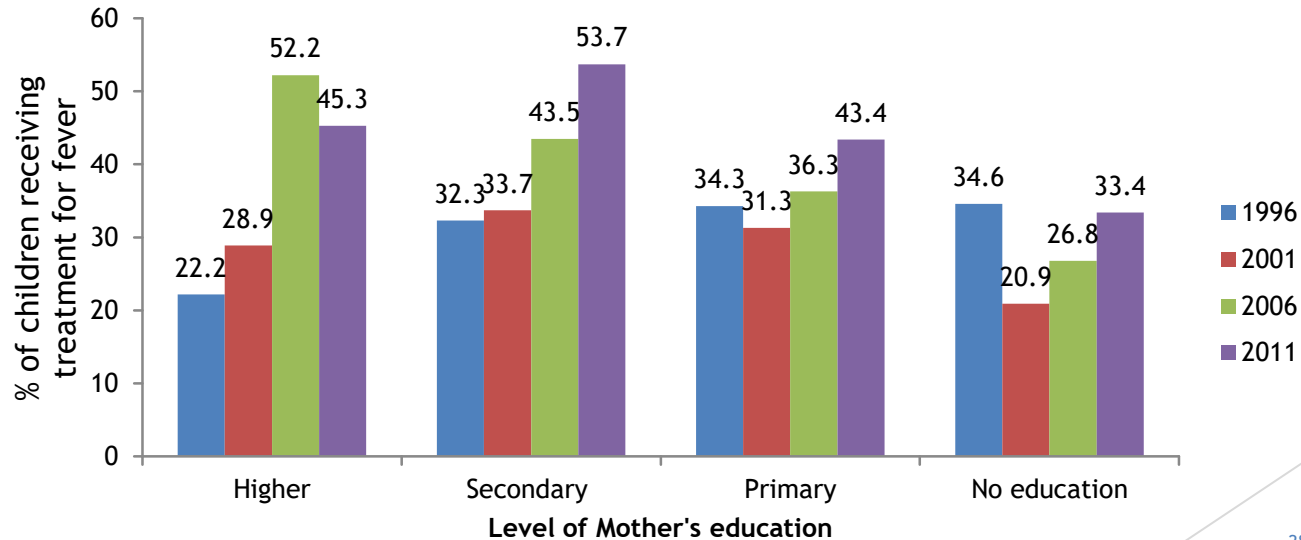


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Figure 4. Percentage of children who had fever in two weeks preceding the survey and who sought treatment in health facility or any other health provider by different levels of mother's education

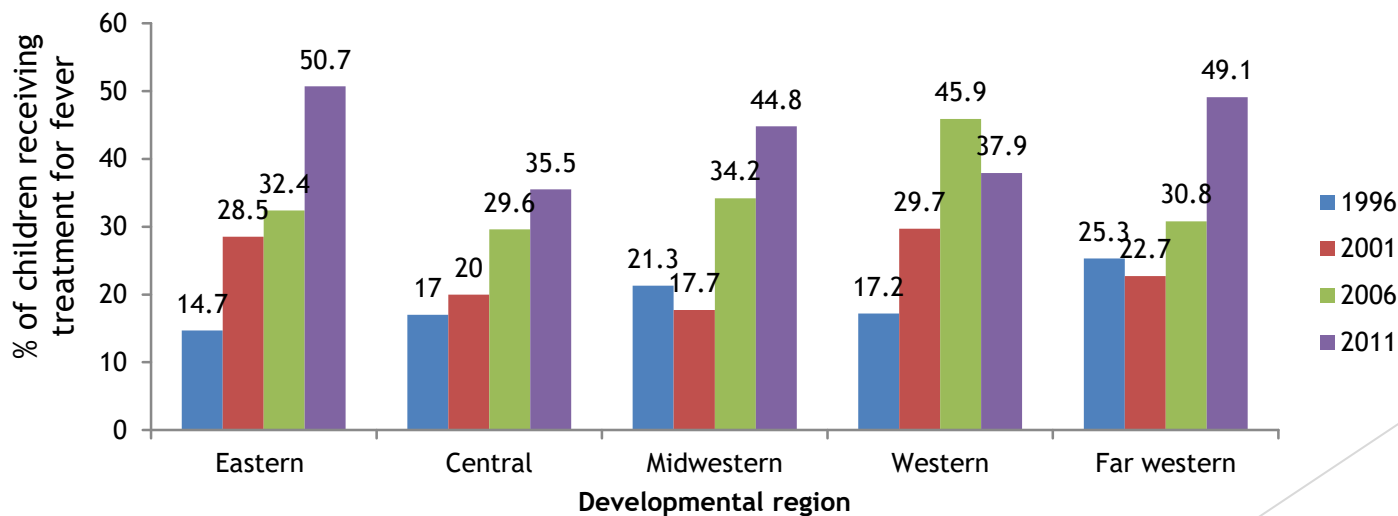


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ORT
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Figure 5. Percentage of children who had fever in two weeks preceding the survey and who sought treatment in health facility or any other health provider by developmental region.

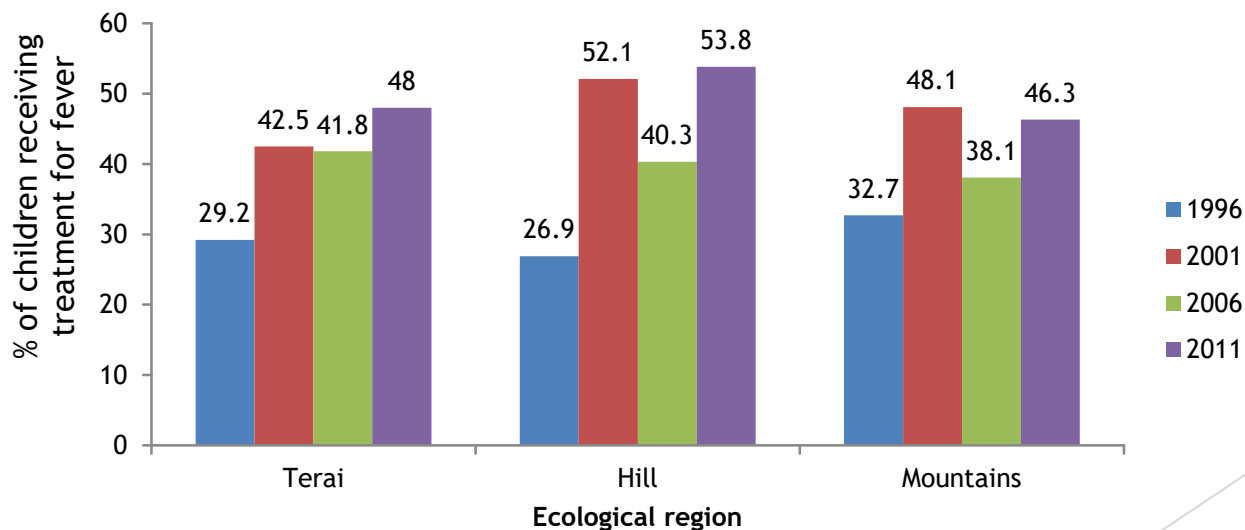


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ORT
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Figure 6. Percentage of children who had fever two weeks preceding the survey and who sought treatment in health facility or any other health provider by ecological region

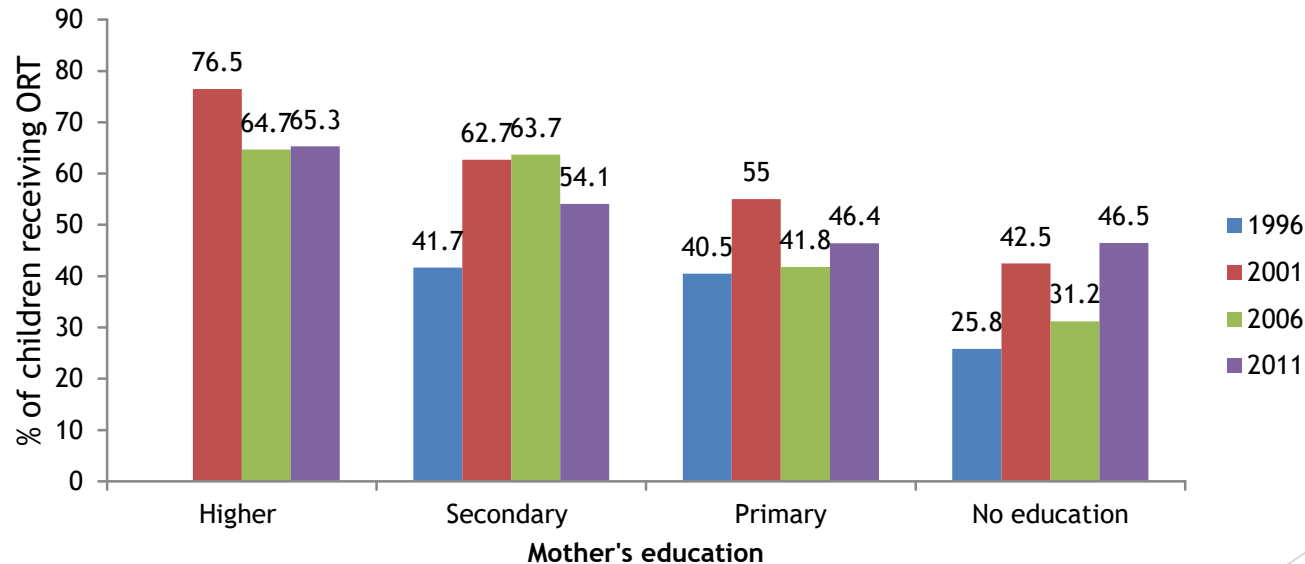


Vaccination
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Fever
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Figure 7. Percentage of ORT coverage in child who had diarrhea 2 weeks preceding the survey as per different levels of mother's education

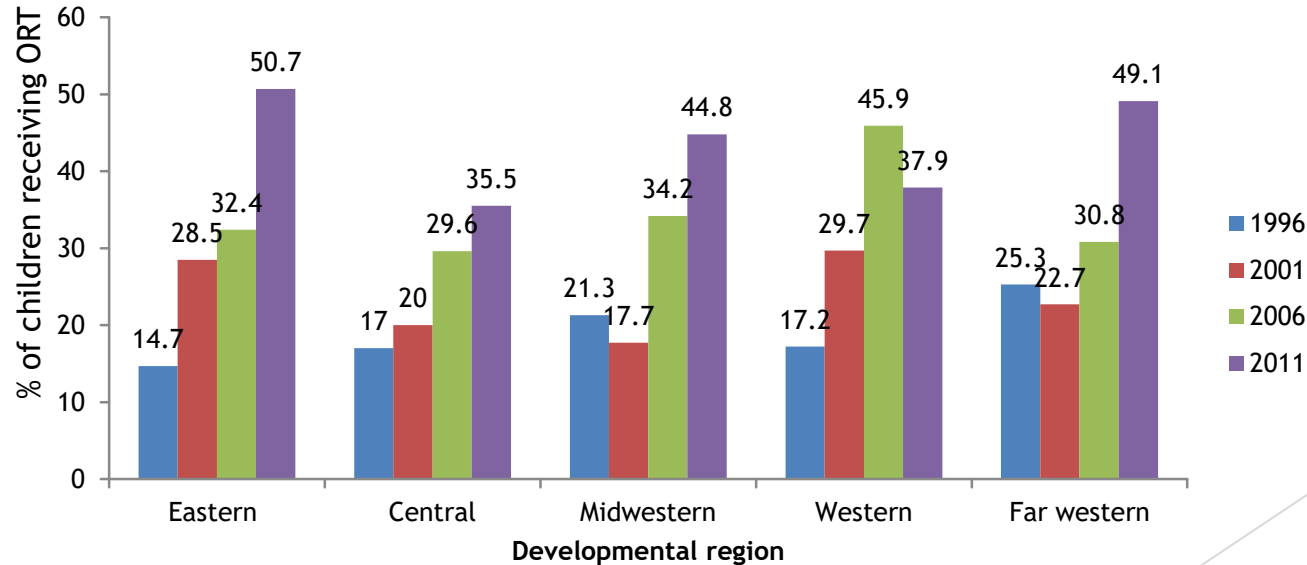


Vaccination
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Fever
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vs Ecological Rgn.

ORT
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Figure 8. Percentage of children who received ORT for diarrhea two weeks preceding the survey by developmental region

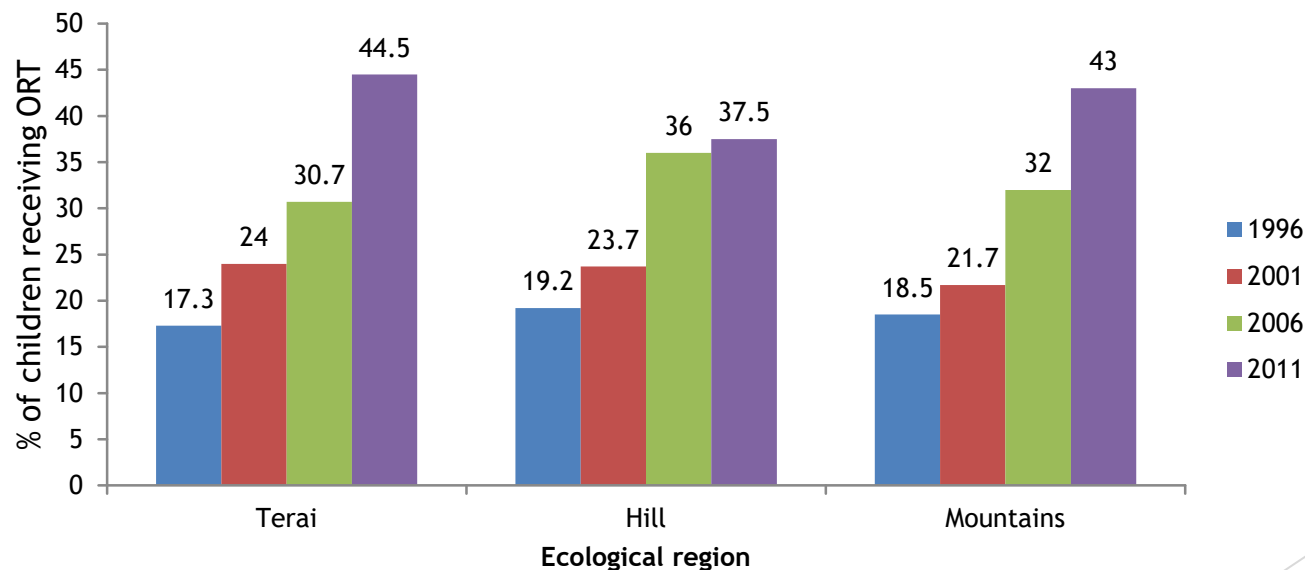


Vaccination
vs Mother's Ed.
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Fever
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vs Dvlpmntl Rgn.
vs Ecological Rgn.

ORT
vs Mother's Ed.
vs Dvlpmntl Rgn.
vs Ecological Rgn.

Figure 9. Percentage of children who received ORT for diarrhea two weeks preceding the survey by ecological region



Vaccination
vs Mother's Ed.
vs Dvlpmntl Rgn.
vs Ecological Rgn.

Fever
vs Mother's Ed.
vs Dvlpmntl Rgn.
vs Ecological Rgn.

ORT
vs Mother's Ed.
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vs Ecological Rgn.

Association between U5MR and complete vaccination by type of residence

Figure 10. Trend in under five mortality compared with children 12-23 months who received complete vaccination

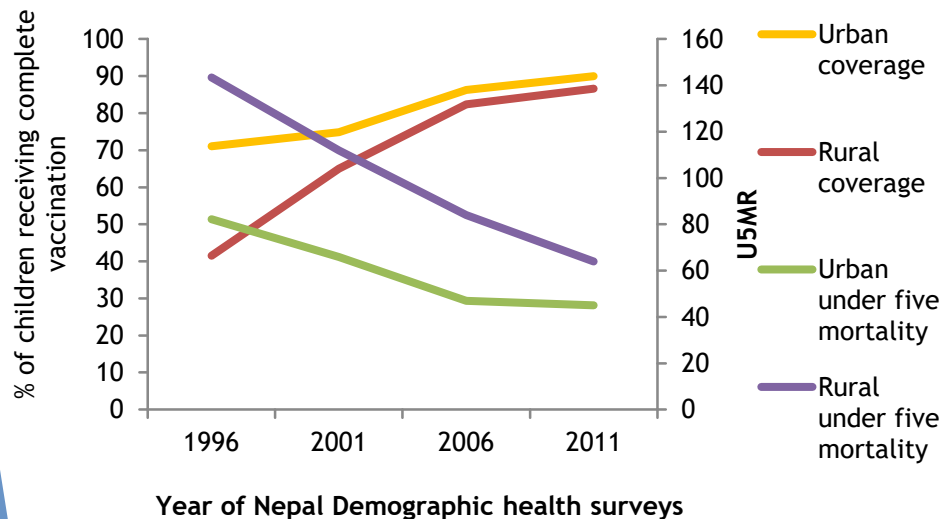


Fig 11. Correlation of urban and rural under five mortality rate with urban and rural complete vaccination coverage

Indicators		U5MR	Vaccination coverage
Urban U5MR	Pearson Correlation	1	-0.97
	Sig. (2-tailed)		0.03
Urban vaccination coverage	Pearson Correlation	-0.97	1
	Sig. (2-tailed)	0.03	
Rural U5MR	Pearson Correlation	1	-0.984
	Sig. (2-tailed)		0.016
Rural vaccination coverage	Pearson Correlation	-0.984	1
	Sig. (2-tailed)	0.016	

Association between U5MR and Fever treatment at health facility or from provider by type of residence

Figure 12. Trend in under five mortality with under five children who had fever in two weeks preceding the survey and who sought treatment in health facility /from provider by residence

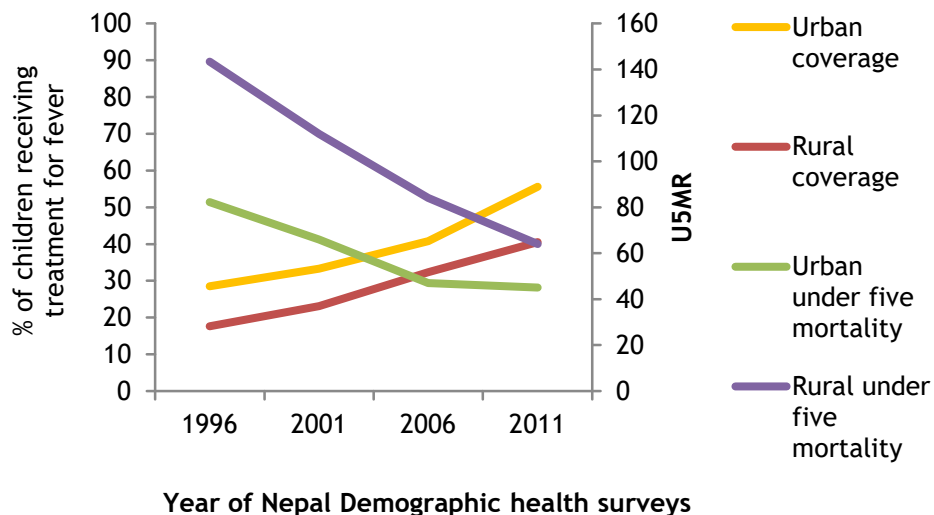


Fig 13. Correlation of urban and rural under five mortality rate with urban and rural fever treatment in health facility /from provider

Indicators		U5MR	Fever treatment coverage
Urban U5MR	Pearson Correlation	1	-0.866
	Sig. (2-tailed)		0.134
Urban - Fever treatment coverage	Pearson Correlation	-0.866	1
	Sig. (2-tailed)	0.134	
Rural - U5MR	Pearson Correlation	1	-0.984
	Sig. (2-tailed)		0.016
Rural - Fever treatment in coverage	Pearson Correlation	-0.984	1
	Sig. (2-tailed) ³⁵	0.016	

Association between U5MR and ORT treatment for diarrhea by type of residence

Fig 14. Trend in under five mortality with ORT two weeks preceding the survey

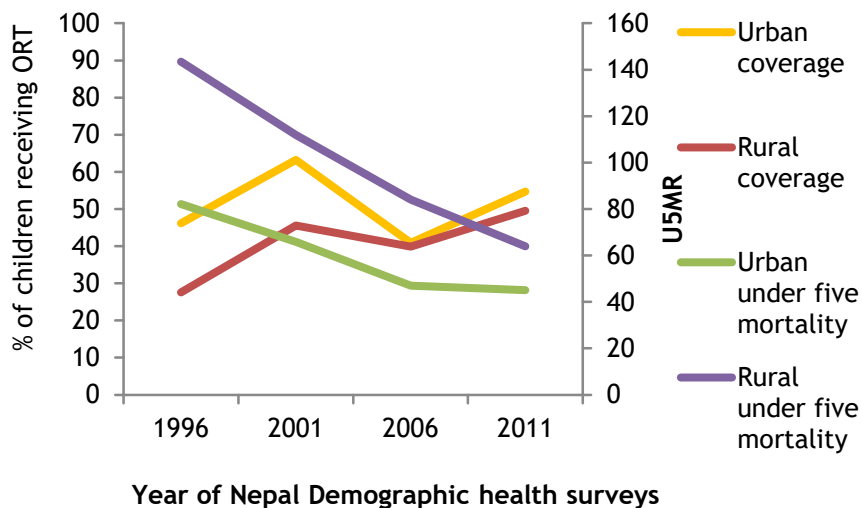


Fig 15. Correlation of urban and rural under five mortality rate with urban and rural fever treatment in health facility /from provider

Indicators		Urban U5MR	Urban ORT coverage
Urban U5MR	Pearson Correlation	1	0.920
	Sig. (2-tailed)	0.08	
Urban ORT coverage	Pearson Correlation	0.920	1
	Sig. (2-tailed)	0.08	
Rural U5MR	Pearson Correlation	1	-0.823
	Sig. (2-tailed)		0.177
Rural ORT coverage	Pearson Correlation	-0.823	1
	Sig. (2-tailed)	0.177	

Figure 13. Percentage change in various implementation indicators compared with percentage of change U5MR by Mother's education

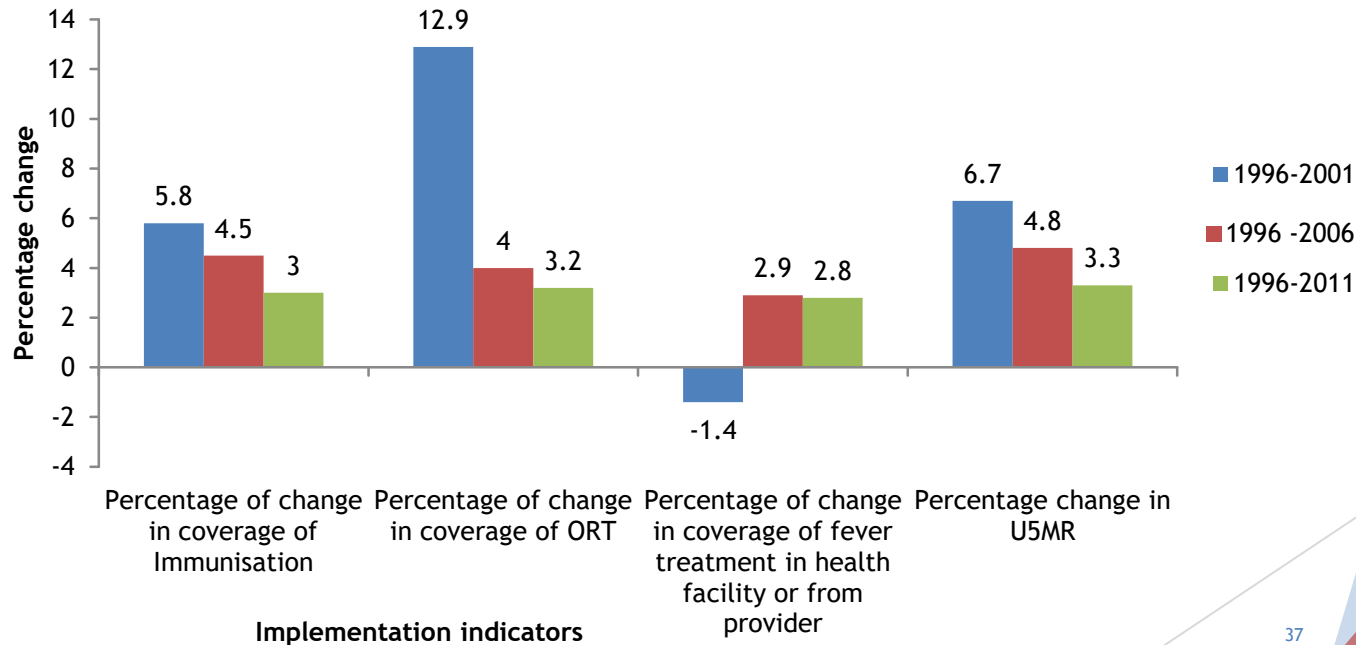


Figure 14. Percentage change in coverage of various child survival interventions compared with percentage change in U5MR by developmental regions

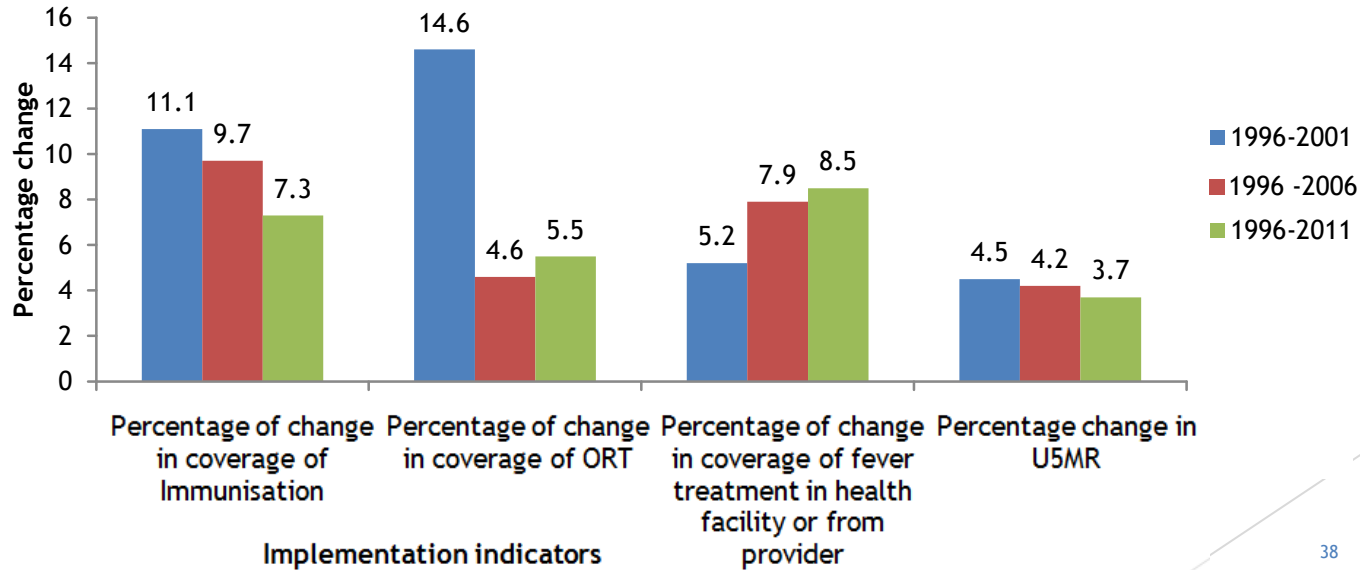
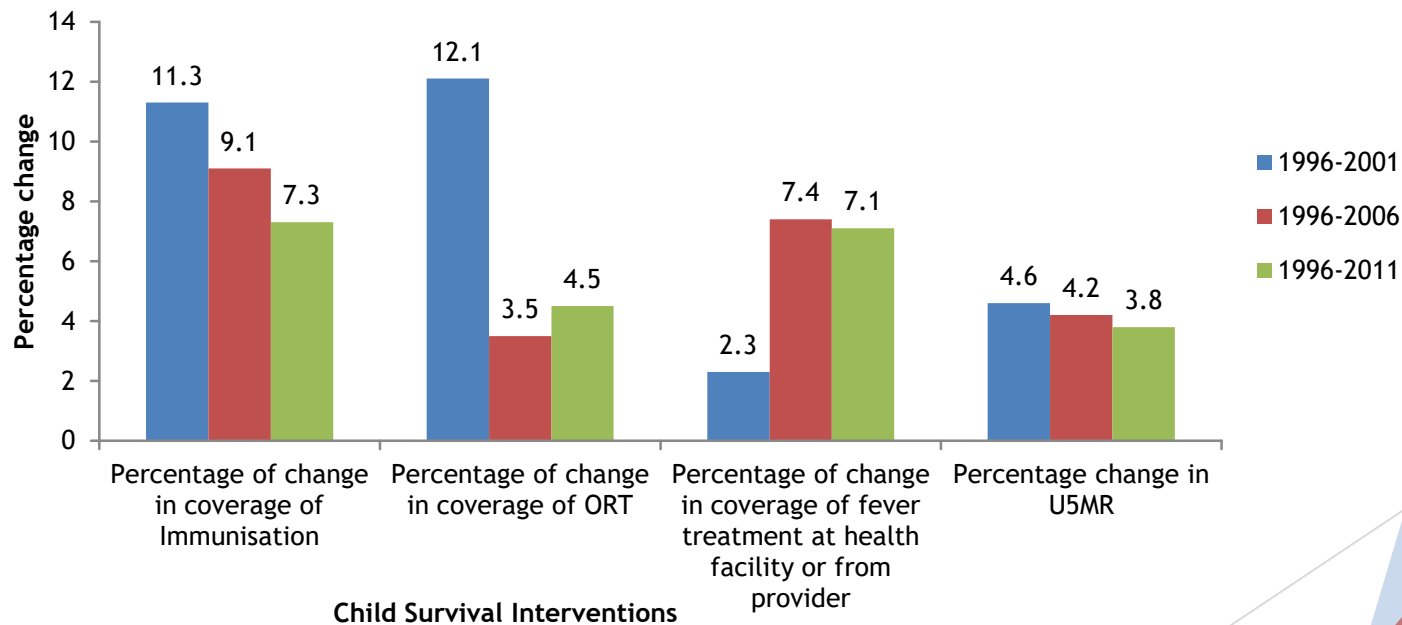


Figure 15. Percentage of change in various implementation indicators compared with percentage of change U5MR by ecological region



Discussion

Discussion

Complete vaccination coverage

- % Change in coverage were maximum when surveys of 2001 and 2006 are compared with 1996.
- Both rural and urban U5MR were associated with coverage in urban and rural vaccination
- Decline of **measles related death to 0%** in Unicef Nepal profile ,2010 can be assumed to be impact of this sustained high coverage of complete vaccination over the last decade.

Discussion

Treatment seeking behavior for fever from health facility or provider

- The maximum coverage for care seeking of fever from health facility or provider for any socioecological variable is just **(53.7%).**
- Rural U5MR is associated with rural coverage for fever treatment however urban coverage for fever treatment is not associated with urban U5MR
- % change in coverage has picked up by **(7-8%)** across different regions when NDHS 2006 and 2011 are compared with NDHS 1996.
- The actual data in NDHS however excludes visits to pharmacies.

Discussion

ORT treatment for diarrhea

- Percentage change in ORT coverage for diarrhea treatment by mother's education, developmental and ecological regions is maximum between surveys carried out for years 1996 and 2001.

Discussion

- ▶ Central developmental region in the nation seems to show less coverage of ORT when compared to Midwestern and Far western regions.
 - ▶ According to Quinley et al Female community health volunteers are most active as care provider in rural areas and most frequent providers in terms of providing ORT (88%).
- ▶ Both urban and rural coverage in ORT treatment are not associated with Urban and rural U5MR.

Conclusion

Conclusion

- Sustained high coverage in complete vaccination across all regions can be singled out as most important child intervention for reducing U5MRs in last decade.
- Increasing coverage in treatment of fever from health facility or provider and ORT treatment for diarrhea can further aid in sustaining the momentum gained in bringing down U5MR.

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