



FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

Linking Agriculture, Food Security, Diet and Nutrition in Nepal: Insights from the USAID Nutrition Innovation Lab, Kathmandu, Nepal.



Sudeep Shrestha, Swetha Manohar, Jamie Dorsey, Abhigyna Bhattarai, Binod Shrestha, Sumanta Neupane, Rolf Klemm, Shibani Ghosh, Patrick Webb, Keith P. West, Jr.



USAID
FROM THE AMERICAN PEOPLE



JOHNS HOPKINS
BLOOMBERG SCHOOL
of PUBLIC HEALTH

Tufts
UNIVERSITY

GERALD J. AND DOROTHY R.
Friedman School of
Nutrition Science and Policy

Aims

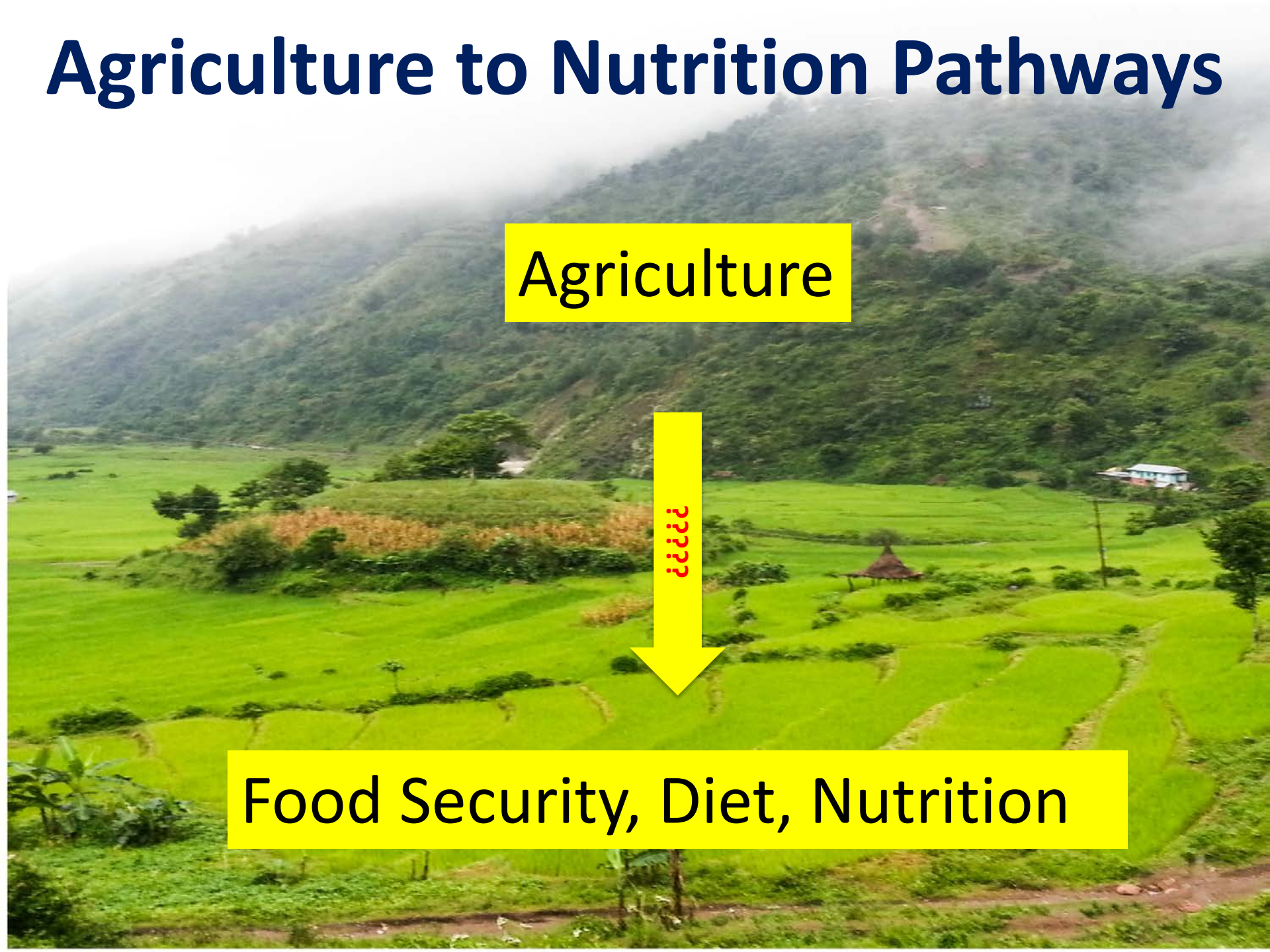
- Design and implement a nationally representative surveillance system
- Explore causal pathways between agriculture and nutrition in the community
- Assess in two national panel survey data (collected annually, every May-July (2013/14), in a nationally representative sample of VDCs in the Mountains, Hills and Terai):
 - Household food access and security
 - Diet quality
 - Nutritional status

Agriculture to Nutrition Pathways

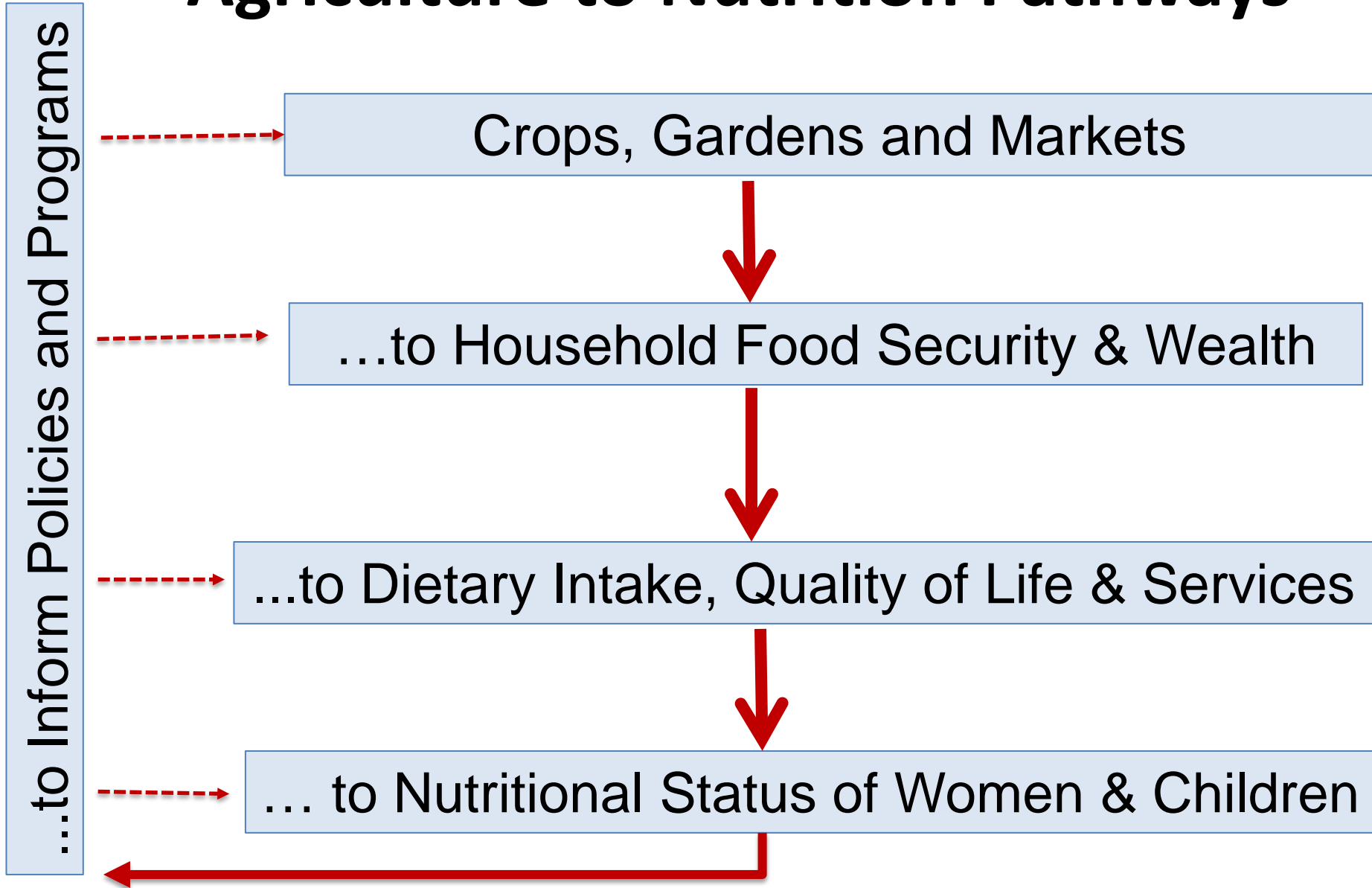
Agriculture

?????

Food Security, Diet, Nutrition



Agriculture to Nutrition Pathways



The Nutrition Innovation Lab-Nepal: Agriculture-to-nutrition national surveillance



Policy and Science for Health, Agriculture and Nutrition (PoSHAN)



Nepal:

- Poor agricultural country (25% population < \$1.25/day)
- Over 80% engaged in agricultural sector, mostly on subsistence family farms.
- Two third of Nepal's poor are farming households



Nepal: Undernutrition and food insecurity are endemic

Food Insecurity

Food Insecure Districts		Food Insecure Households (%)		
Food Deficit	Food Insecure	Overall	Moderate	Severe
43	23	~50	23	16

(UNICEF 2009)

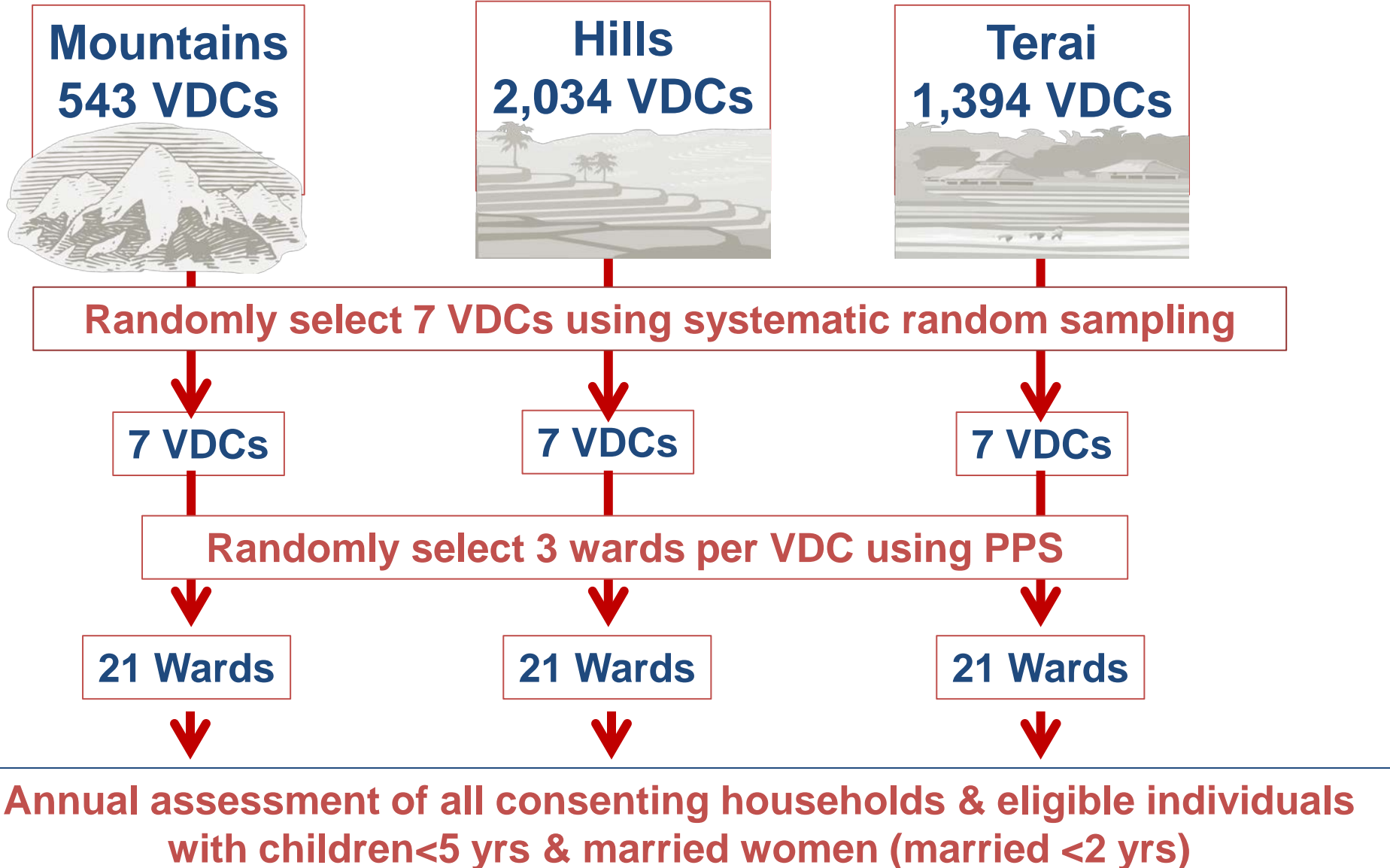
Undernutrition

Child Undernutrition (%)		
Stunting	Wasting	Underweight
41	11	29

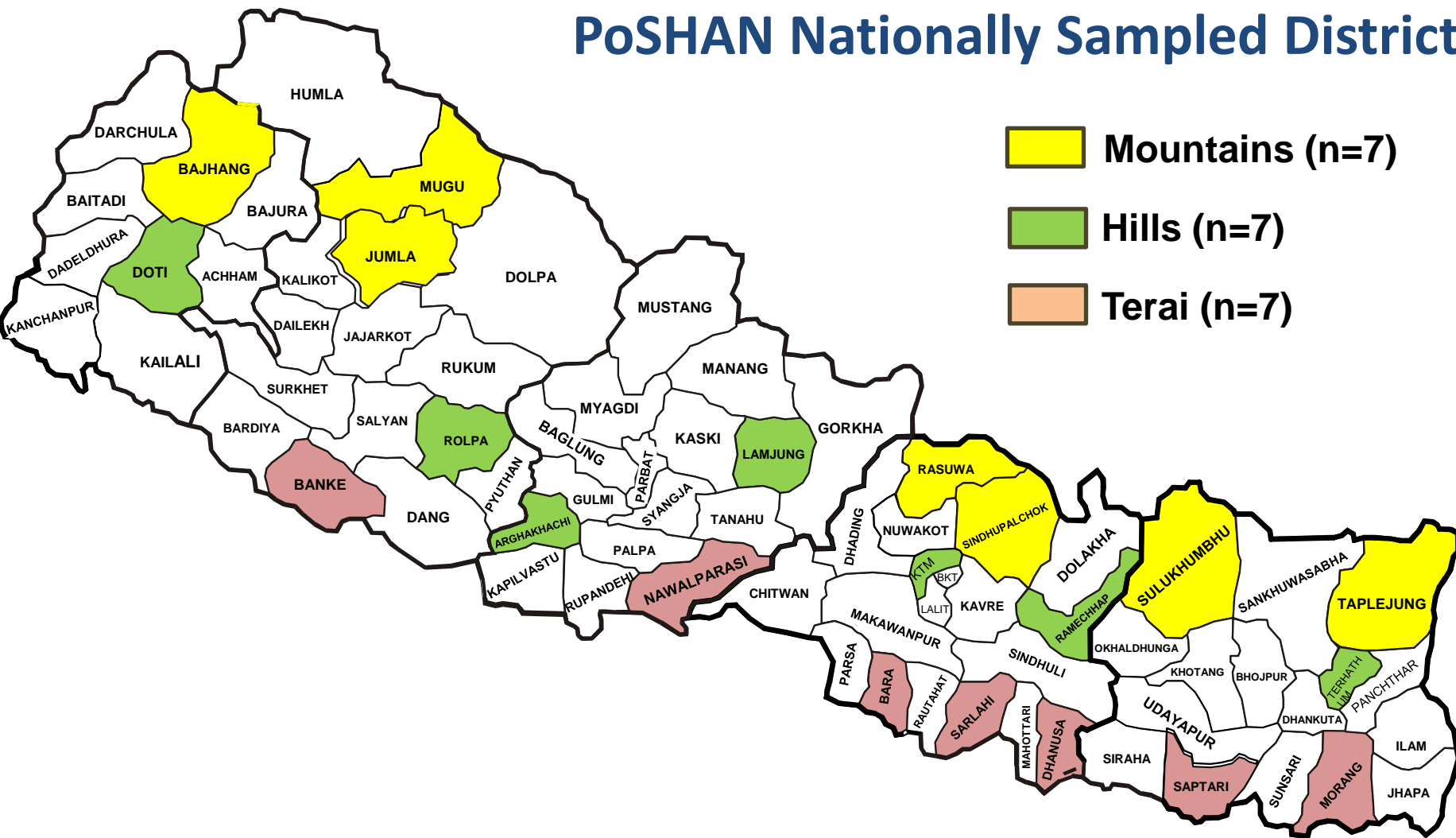
Maternal Undernutrition (%)		
Underweight	Overweight/Obese	Short stature
18.2	13.5	11.6

(NDHS 2011)

PoSHAN National Study Design



PoSHAN Nationally Sampled Districts



21 Districts, 21 VDCs, 63 wards

N = ~5000 households with preschool children

Annual assessments: May-July 2013, 2014

PoSHAN Community Study Participants

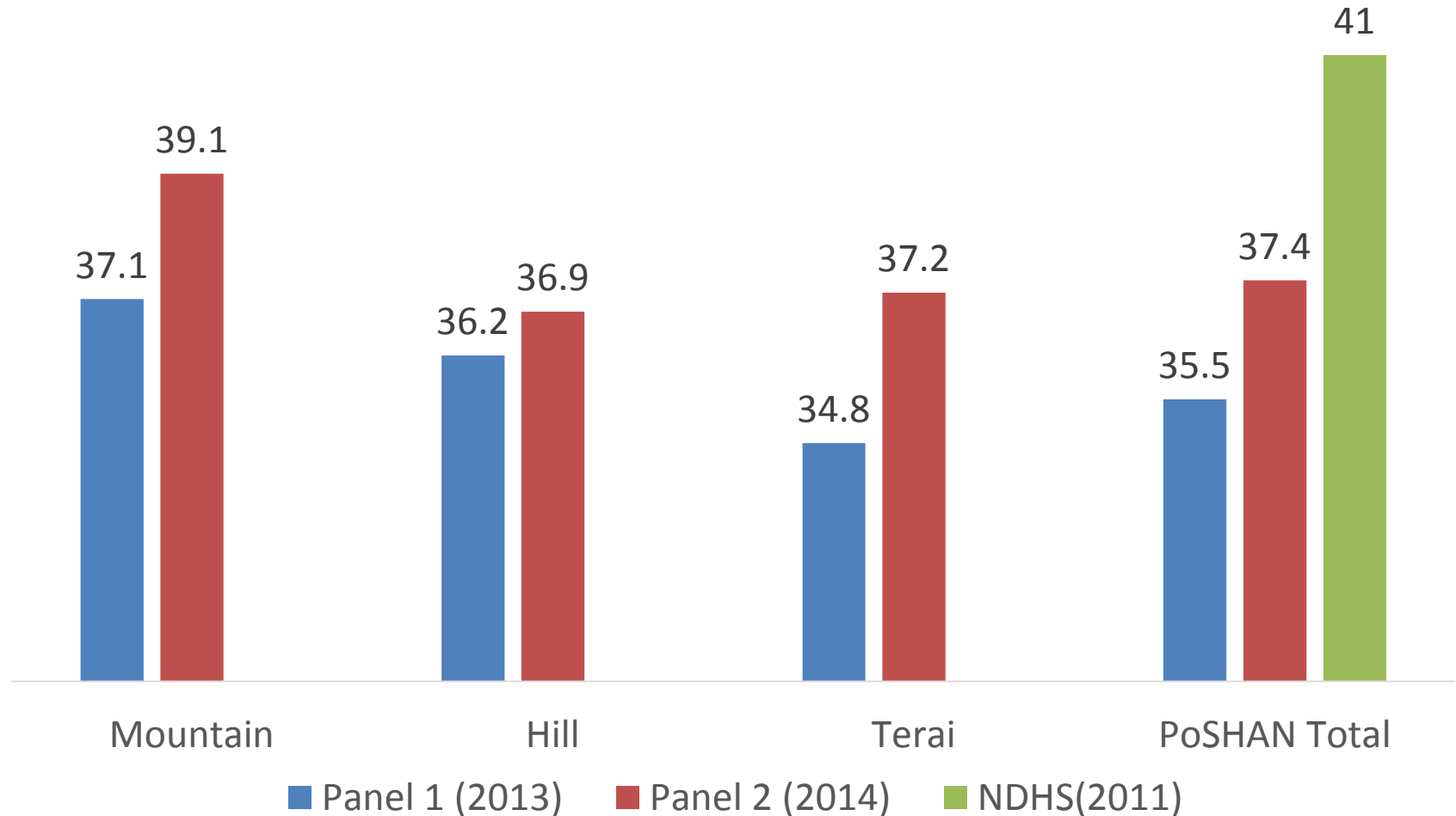


Panel 2 (2014)	Mts	Hills	Terai	Total
No. Households (N)	834	1352	2761	4947
No. of Women (N)	826	1424	2952	5202
No. of Children <5 years (N)	834	1325	3315	5474

A total of **4288** households, **4509** women, **5401** children interviewed in Panel 1 (2013)

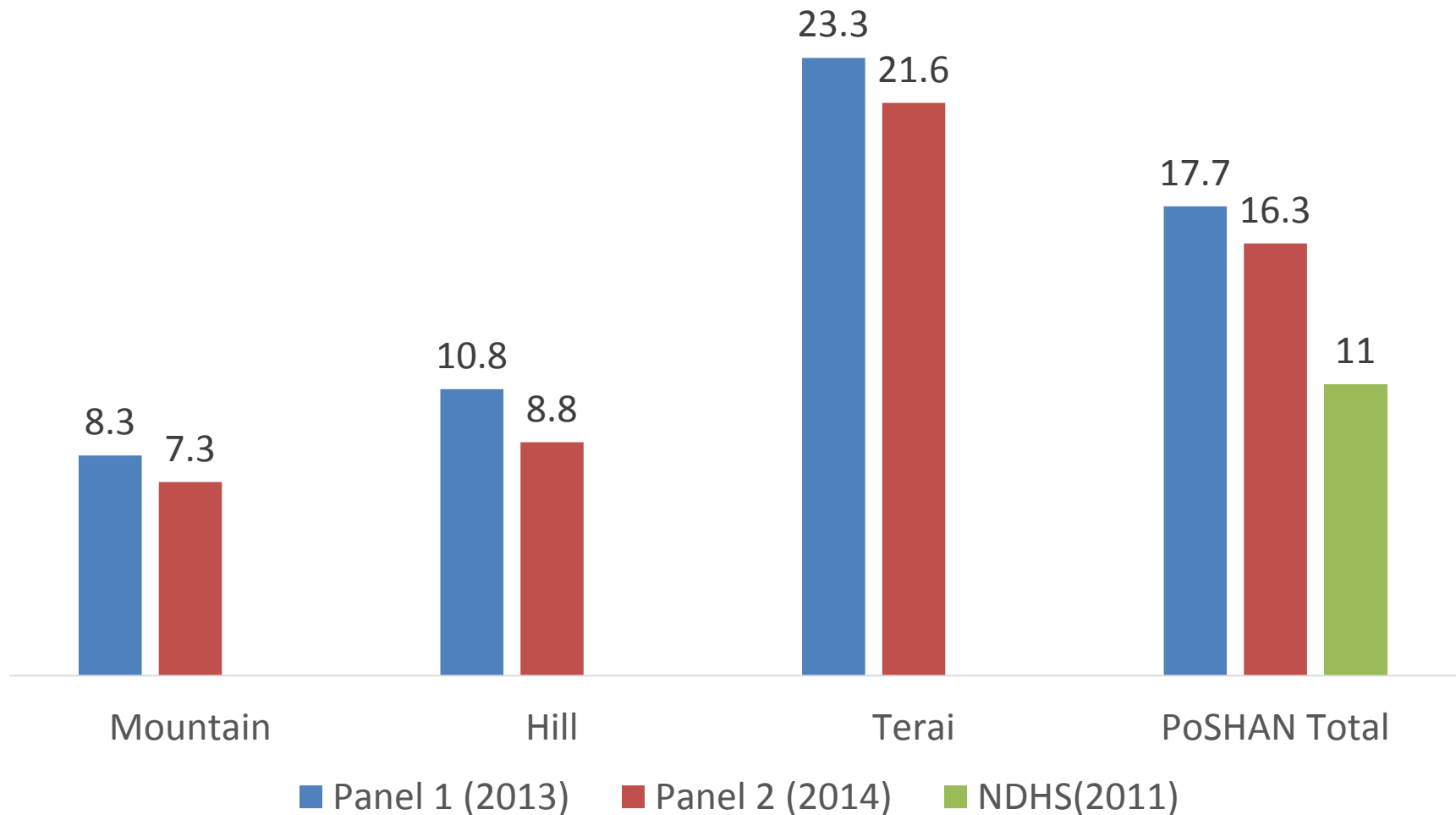
Findings: Stunting remained high..

Stunting prevalence (among children <5 years) between Panel 1 (2013) and Panel 2 (2014) surveys



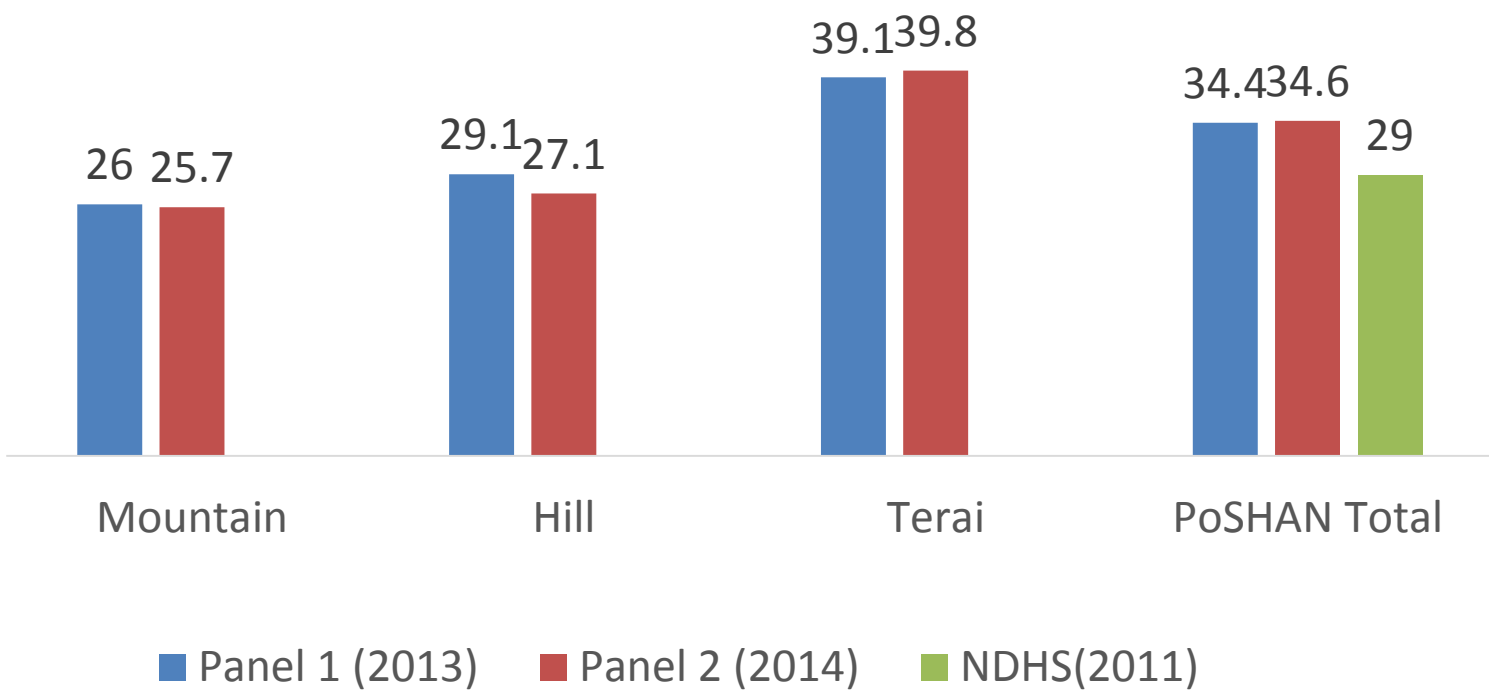
Child wasting is worst in Terai..

Wasting prevalence (among children <5 years) between Panel 1 (2013) and Panel 2 (2014) surveys



Underweight remains high in Terai...

Underweight prevalence (among children <5 years) between Panel 1 (2013) and Panel 2 (2014) surveys



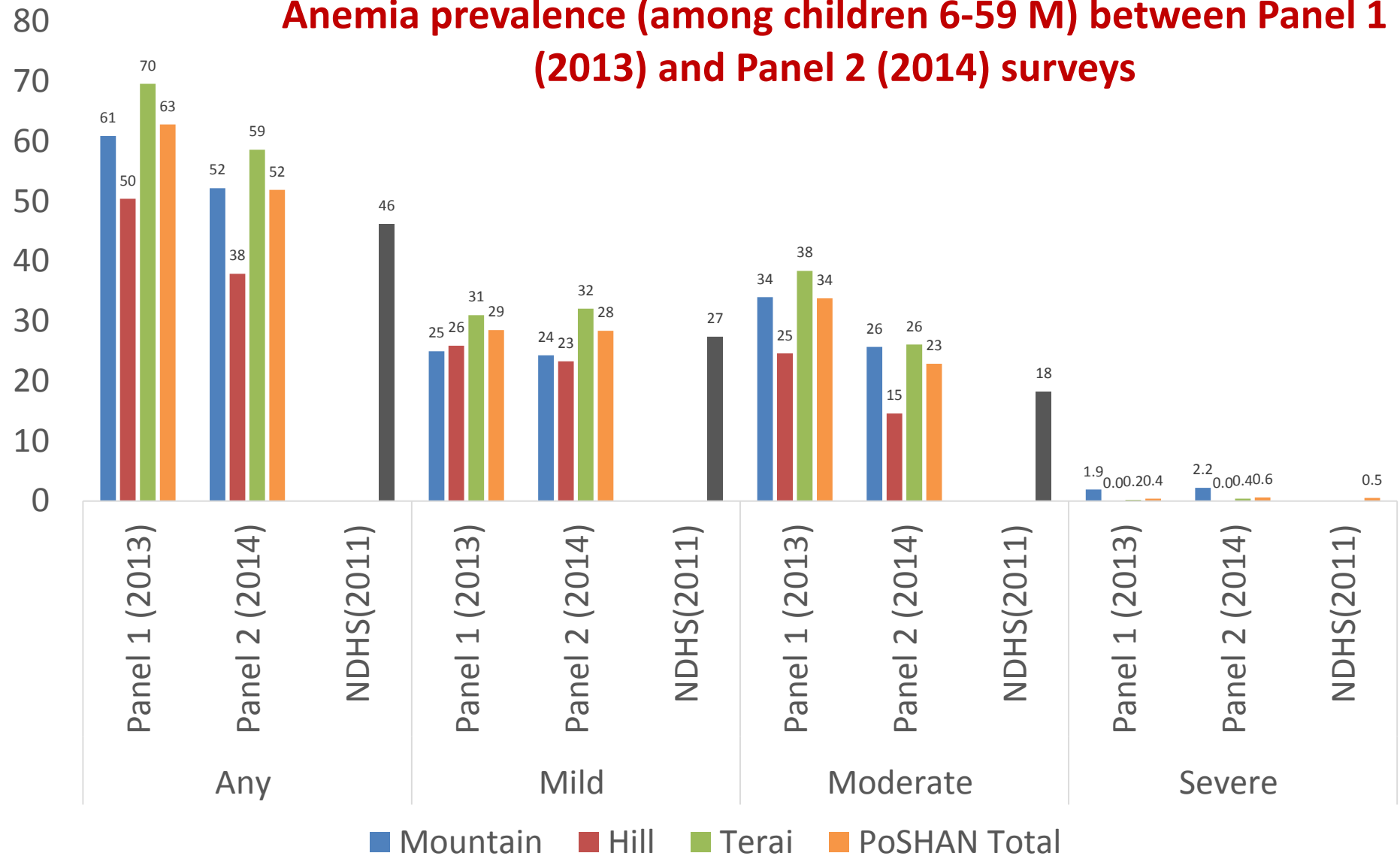
Risk of Maternal Wasting (by BMI)

Highest in the Terai

	Underweight			Overweight/Obese			Short stature		
	Panel 1 (2013)	Panel 2 (2014)	NDHS (2011)	Panel 1 (2013)	Panel 2 (2014)	NDHS (2011)	Panel 1 (2013)	Panel 2 (2014)	NDHS (2011)
Mountains	19.2	16.8		8.7	10.9		6.9	7.63	
Hills	16.3	13.7		13.3	17.3		8.7	9.9	
Terai	37.2	33.7		7	8		14.3	14.6	
PoSHAN Total	28.4	25.3	18	9	11.1	13.5	11.6	12.2	11.6

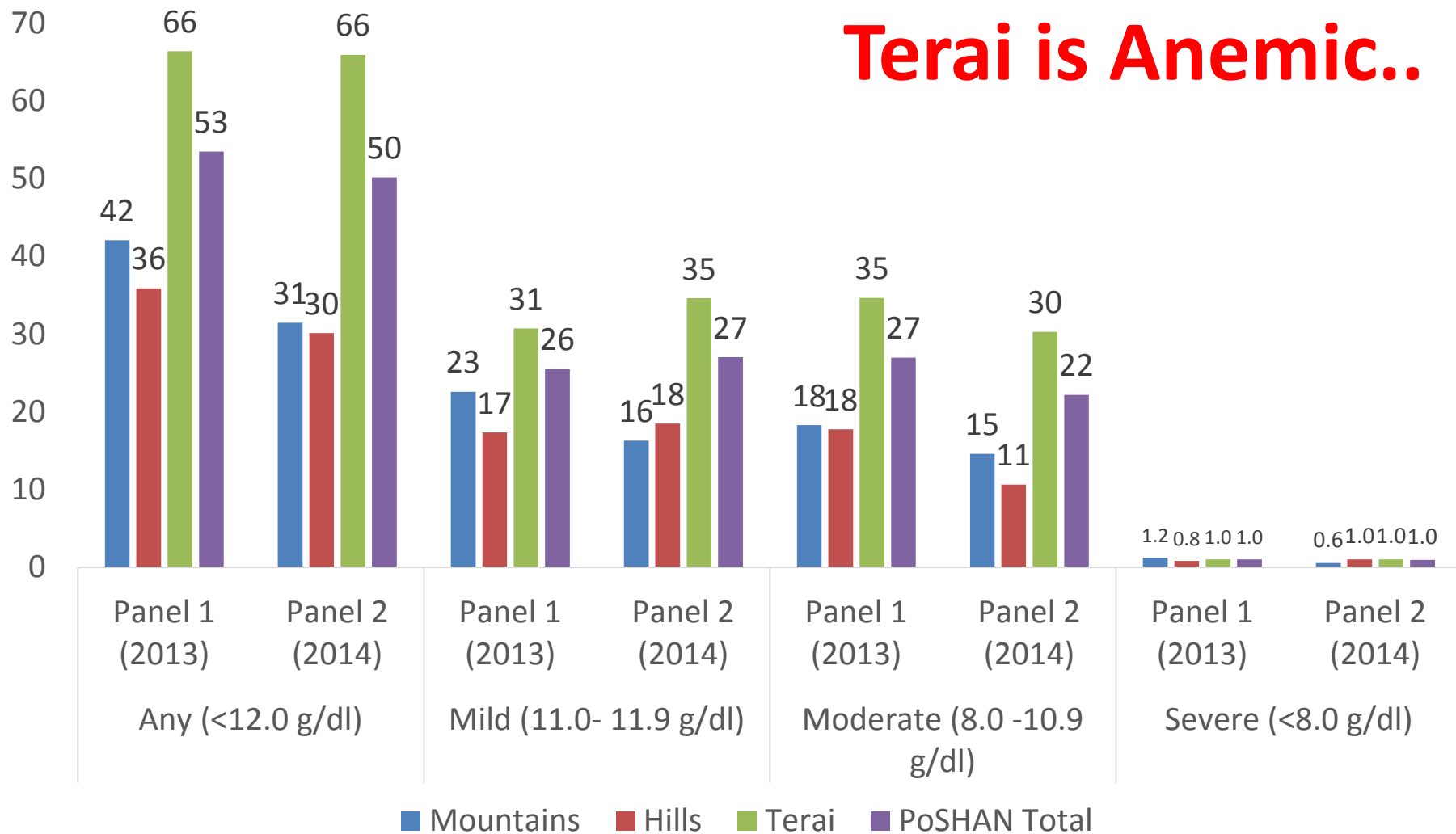
Anemia in children improved but still high

Anemia prevalence (among children 6-59 M) between Panel 1 (2013) and Panel 2 (2014) surveys



Anemia prevalence (Non-pregnant Women) between Panel 1 (2013) and Panel 2 (2014) surveys

Terai is Anemic..



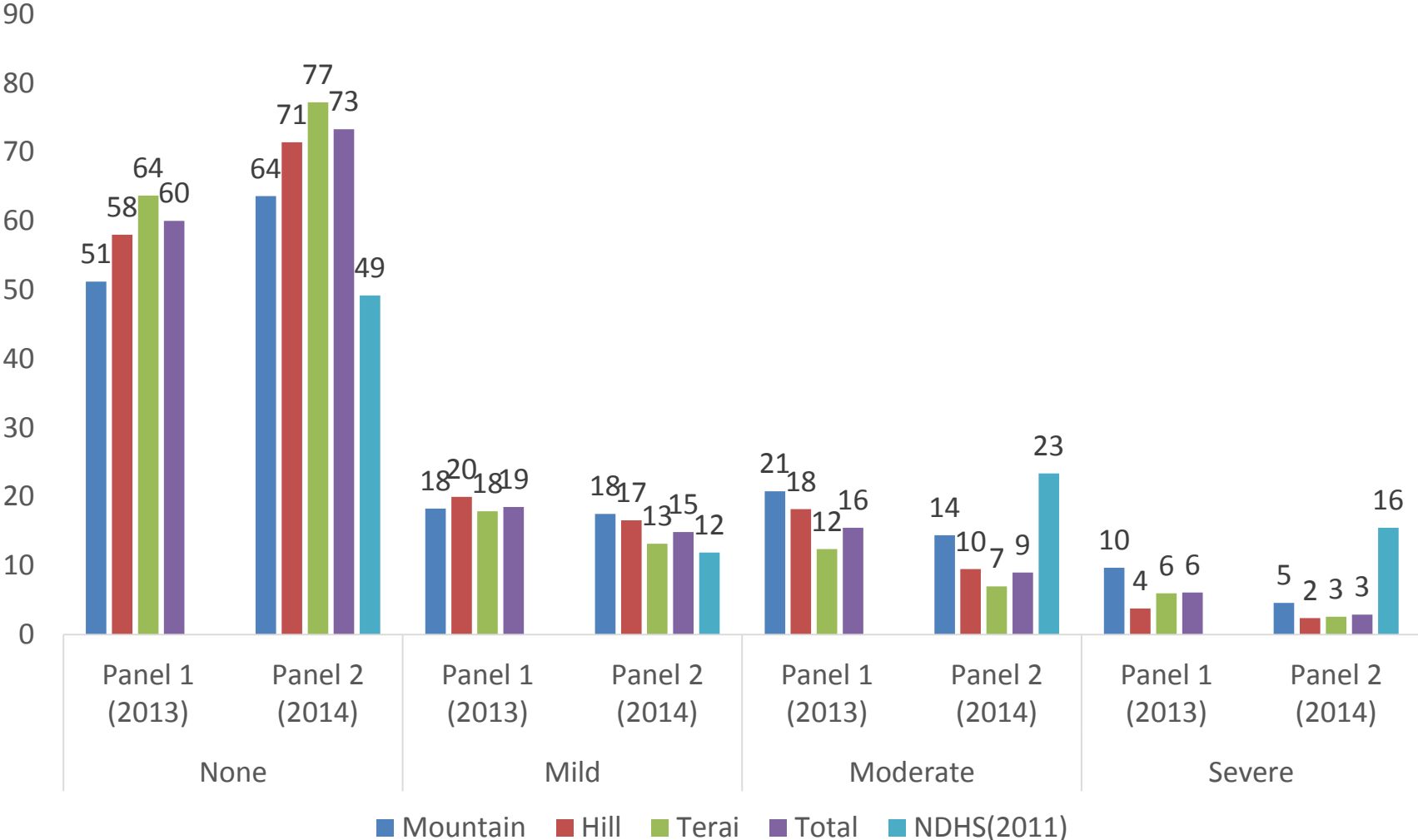
Terai is Anemic..

Anemia (non-pregnant)	Any		Mild		Moderate		Severe	
	Panel 1 (2013)	Panel 2 (2014)	Panel 1 (2013)	Panel 2 (2014)	Panel 1 (2013)	Panel 2 (2014)	Panel 1 (2013)	Panel 2 (2014)
Mountains	42	31	23	16	18	15	1.2	0.6
Hills	36	30	17	18	18	11	0.8	1.0
Terai	66	66	31	35	35	30	1.0	1.0
PoSHAN Total	53	50	26	27	27	22	1.0	1.0

Anemia (pregnant)	Any		Mild		Moderate		Severe	
	Panel 1 (2013)	Panel 2 (2014)	Panel 1 (2013)	Panel 2 (2014)	Panel 1 (2013)	Panel 2 (2014)	Panel 1 (2013)	Panel 2 (2014)
Mountains	53	22	32	17	21	6	0	0
Hills	48	29	28	21	20	8	0	0
Terai	64	63	33	27	32	36	0	0
PoSHAN Total	59	50	32	24	28	25	0	0

Household Food Insecurity Access Scale (%)

HHs food insecurity improving, Terai is better..



Agricultural Practices by Agro Ecological Zone:

Better Agricultural Practices in Terai

Agricultural practices	Mtns	Hills	Terai
Use of agro chemicals (pesticide)	11.3	8.2	49.6
Market prices checking	18.3	1.8	15.1
Composting	47.1	64.3	42.5
Improved seed	28.3	34.0	48.4
Improved drying methods/tools	48.9	59.3	52.9
Inter-cropping	48.7	62.5	28.9
Intergrated pest management	14.3	13.0	10.3
Mechanized tools	1.9	3.0	52.5
Food processing	48.3	53.2	71.8
Storage equipment	6.3	3.6	8.3
Livestock vaccination	3.8	14.5	23.2

Conclusion

Maternal nutritional status paralleled improved food security from 2013-14, but child growth did not improve. Nutritional status was poorest in the terai despite better food security and agricultural practices.

Acknowledgements

- **Funding: USAID** through Feed the Future Innovation Lab for Collaborative Research on Nutrition
- **Management Entity:** Tufts University
- **PoSHAN Community Studies**
 - **PI:** Dr. Keith P. West, Jr., Dr. Rolf D.W. Klemm
 - **Co-I:** Dr. Devendra Gauchan, Dr. Ramesh Adikhara, Swetha Manohar, Dr. Shibhani Ghosh, Dr. Patrick Webb, Dr. Sudeep Shrestha
- **Data Collectors:** New Era Pvt Ltd; NTAG
- **PoSHAN-JHU Technical Team:** Ruchita Rajbhandary, Abhigyana Bhattarai, Dr. Raman Shrestha, Hari Krishna Shah, Binod Shrestha, Sumanta Neupane, Jamie Dorsey
- **PoSHAN-Tufts Technical Team:** Diplov Sapkota