INDIAN
INSTITUTE OF
PUBLIC HEALTH
BHUBANESWAR

Developing Heat Wave Action Plan in Odisha

Assessing Thresholds & Vulnerabilities

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OSDMA

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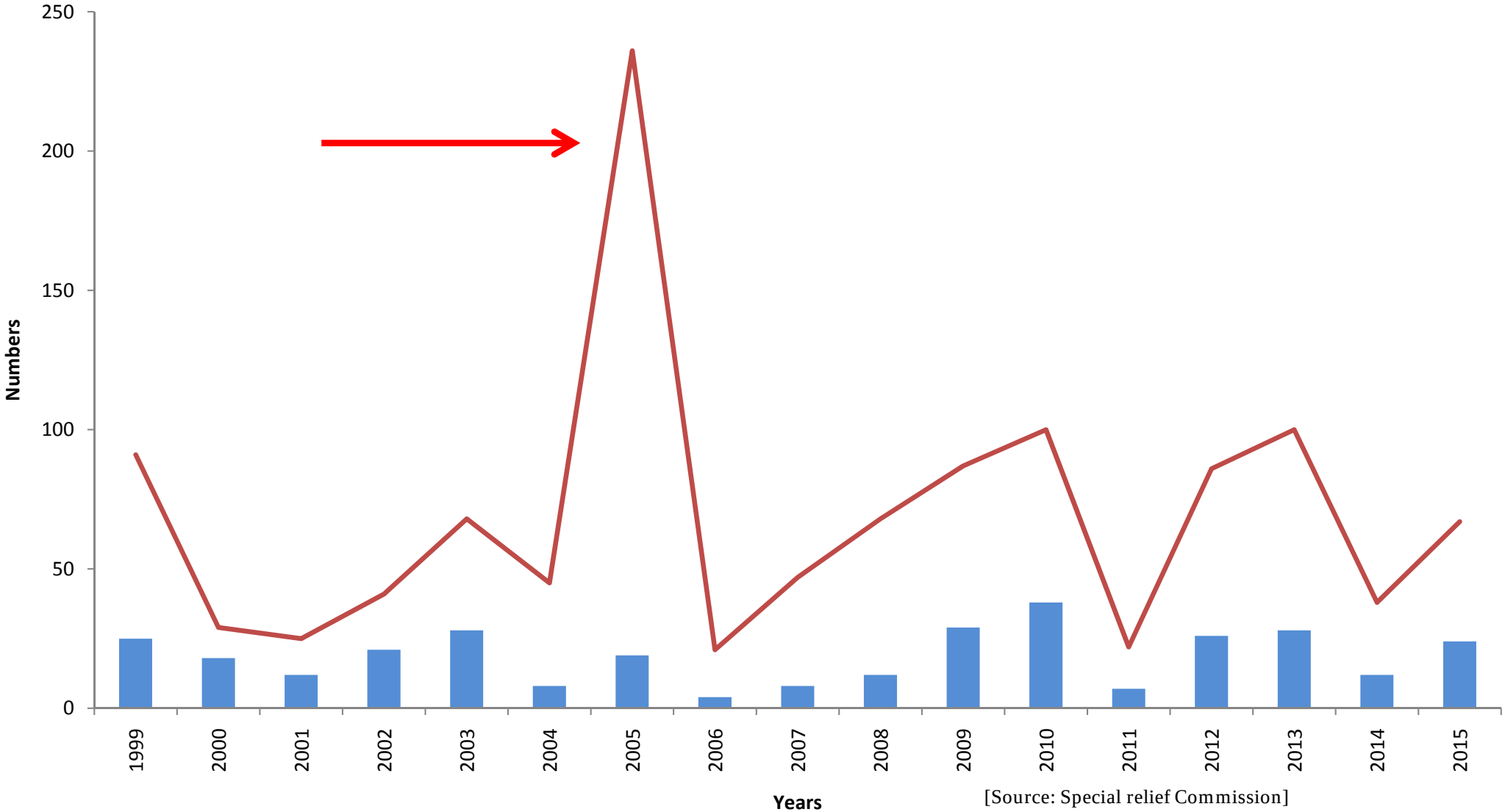
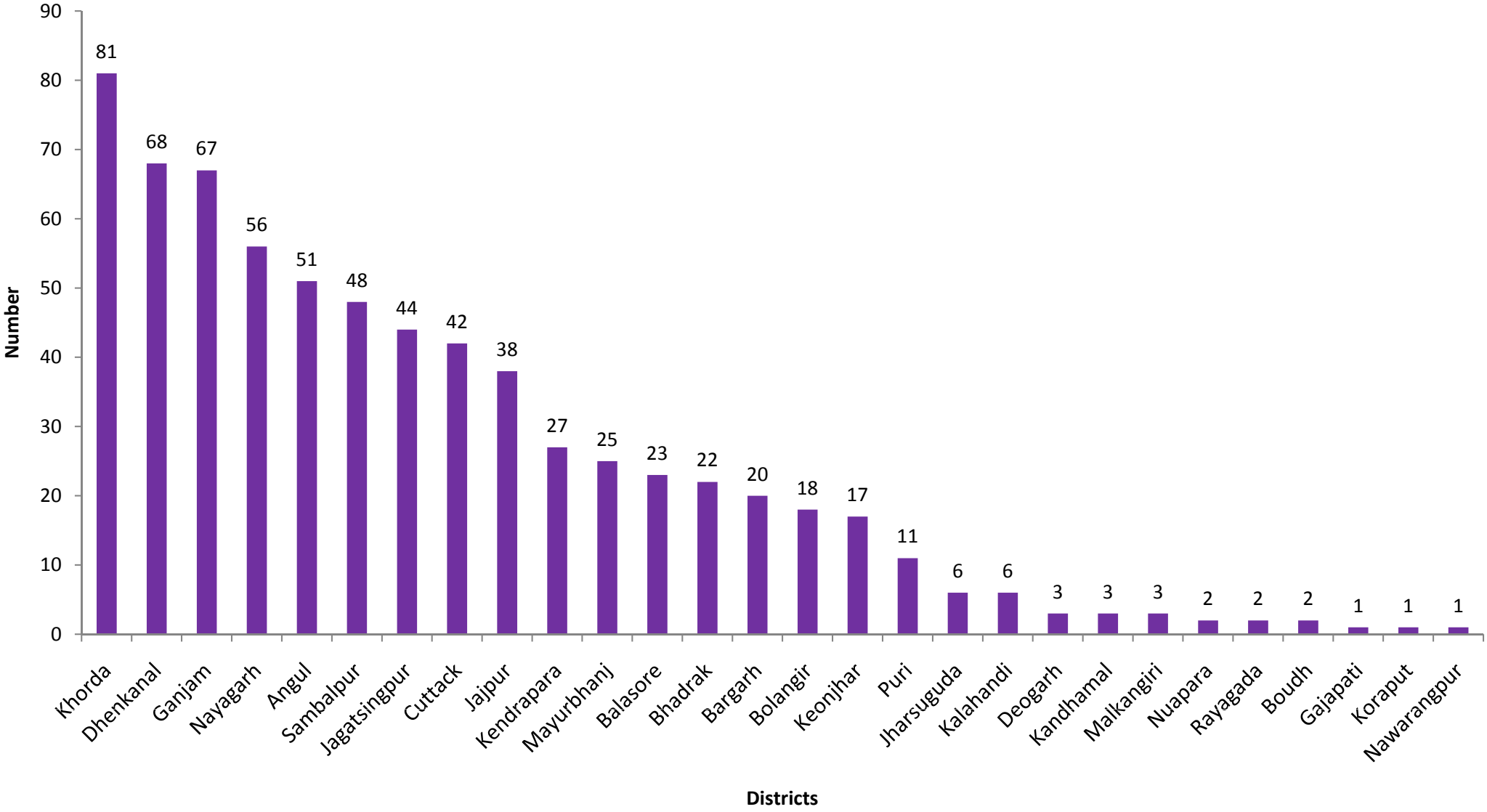
Heat Wave situation in Odisha

Heat Wave related death (line) with number of Heat Wave days (bar) in Odisha after 1998



[Source: Special relief Commission]

Heat Related Deaths District wise during 1999-2009



[Source: Special Relief Commissioner]

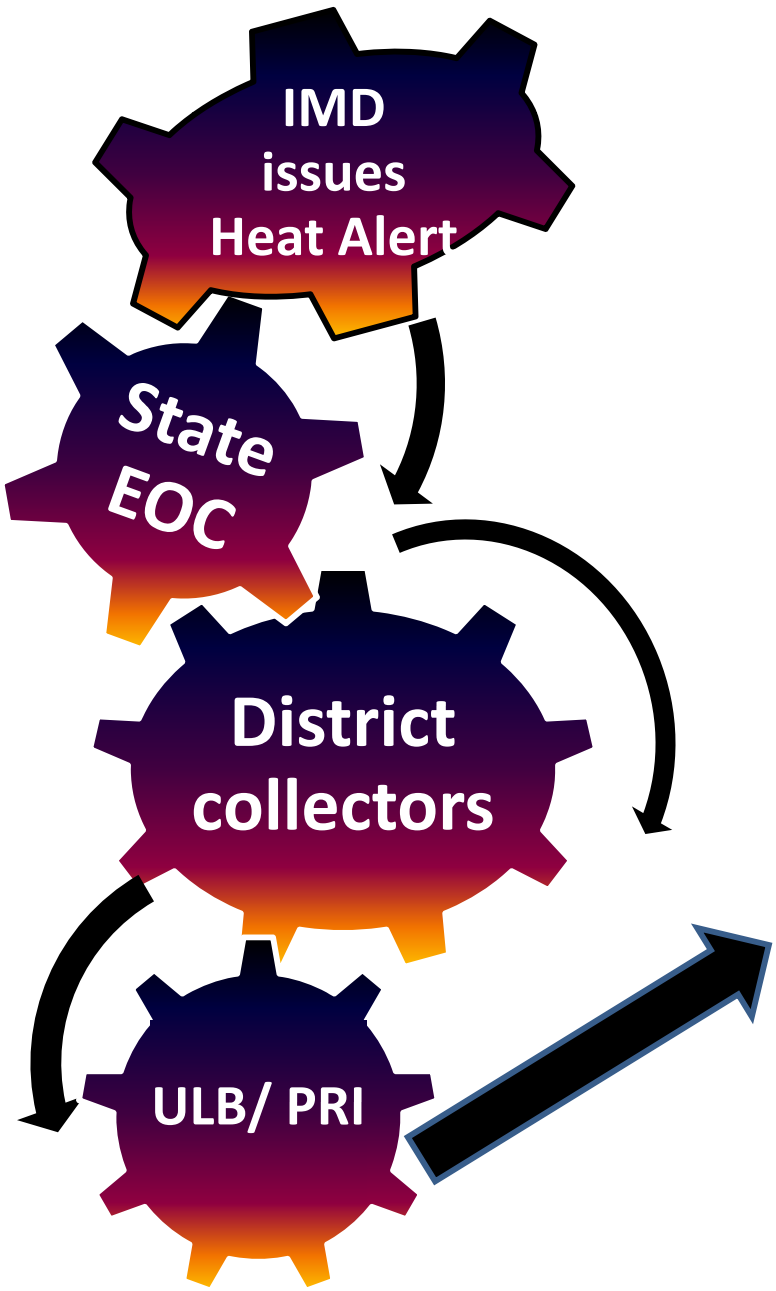
Death toll in Odisha

- Heat waves in Odisha killed 2042 in 1998 and in 1999, the state implemented its first HAP.
- Despite already having a HAP in place, the state experienced another massive Heat Wave casualty in 2005 losing 236 lives.
- Many reasons like increasing urbanization, pollution, industrialization and climate change have exacerbated this problem.
- **CAVEAT: Direct heat-related deaths may be overwhelmed by indirect heat-related deaths**

Strengthening Heat Action Plan: Odisha Experience

Knowledge Partnership

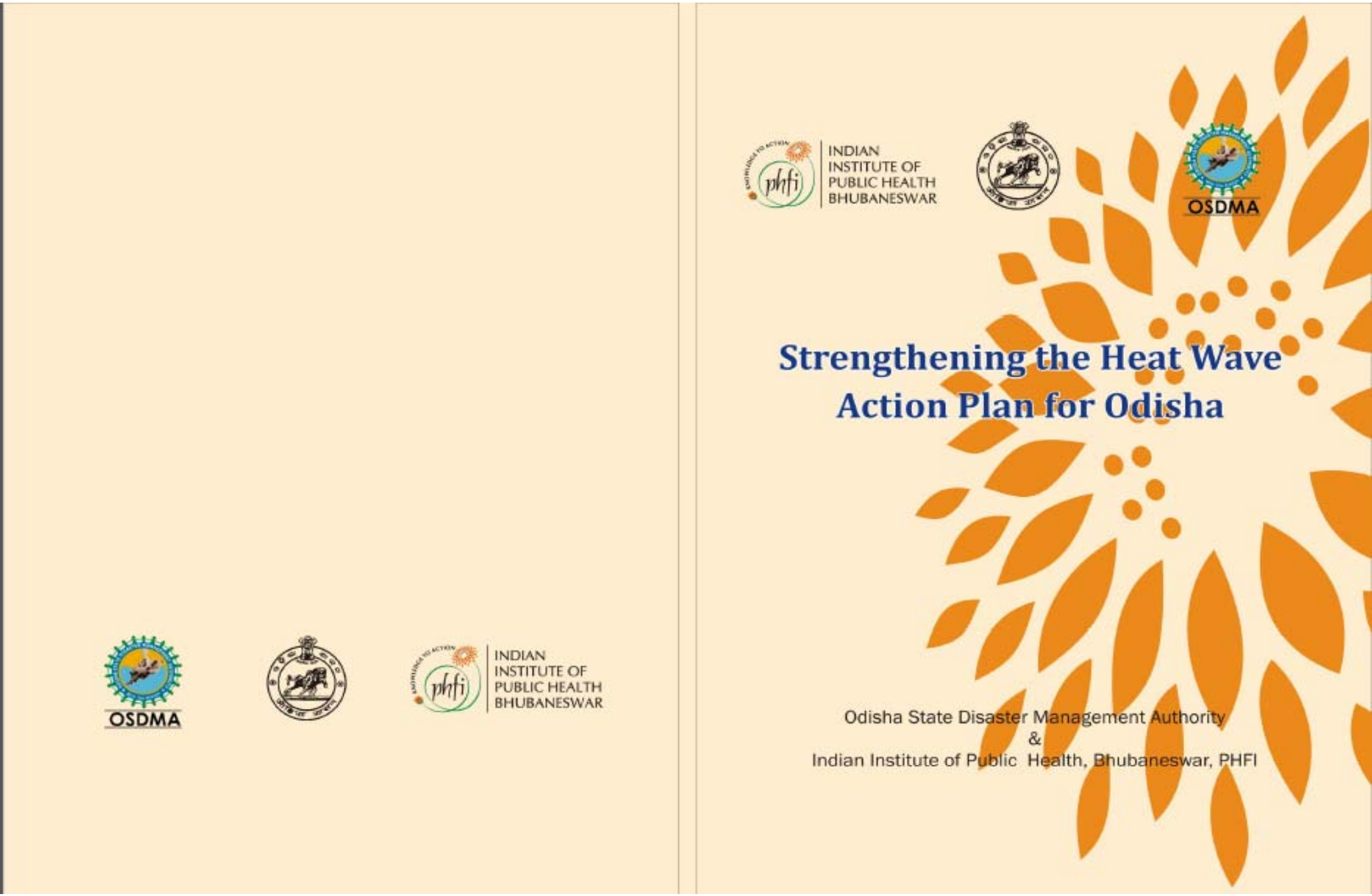
- OSDMA as the nodal agency
- Steering committee set up with all the concerned depts. OSDMA as convener and IIPHB as knowledge partner
- IIPHB developed the strengthened action plan
- SOPs for all the concerned departments developed
- Monitoring of the SOPs by OSDMA regularly
- IIPHB entrusted with the task of threshold assessment and vulnerability assessment
- Evaluation of the implementation of the HAP
- Development of new HAP (2016)
- Subsequent ones being developed before March of every year



- Held meeting before summer.
- Involved stakeholders on Heat Wave preparedness.
- Developed mechanisms to alert to all the stakeholders.
- Orientation on the SOPs/check list for all concerned department.
- Implementation of checklist.
- Process evaluation in collaboration with IIPH-B.
- Identify strategic points for water distribution and sheds.

- Schools and colleges
- Banks and financial institutions
- Commerce and Transport
- Panchayats and Block Development Officers
- Religious places
- Hotels, hawkers and street vendors
- Construction site supervisors
- Civil Society Organizations
- Home (Police/ Fire Department)
- Water Resources department

Strengthened first HAP released on March 14, 2016

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Dr Lipika Nanda
Shri P K Mohapatra
Shri S C Bhan
ANJALI JAISWAL

ସାବଧାନ ! ସାବଧାନ !

ଅଂଶୁଘାତକୁ ସାବଧାନ

ପାଖରେ ଥିବ ପାଣି ବୋତଲ
ହାତରେ ଥିବ ଛତା
ପାଦରେ ଥିବ ଚପଲ ଯଦି
ଖରାକୁ ନାହିଁ ଚିନ୍ତା

- ଦିନ ୧୧ ଟାରୁ ୩ଟା ଭିତରେ ଖରାର ତାତି ସବୁଠାରୁ ଅଧିକ ଥାଏ । ଏଣୁ ଟାଣ ଖରାରେ ପଦାକୁ ବାହାରନ୍ତୁ ନାହିଁ।
- ଅଧିକ ପାଣି, ଓ.ଆର.ଏସ୍., ପଣା, ତୋରାଣି, ଘୋଳଦହି, ଆଖୁରସ ପିଅନ୍ତୁ ଓ କାକୁଡି, ତରଭୂଜ ଆଦି ଖାଆନ୍ତୁ ।
- ଖରାରେ କଠିନ ପରିଶ୍ରମ କରନ୍ତୁ ନାହିଁ ।
- ହାଲିଆ ଲାଗିଲେ ଛାଇ ଯାଗାରେ ବିଶ୍ରାମ କରନ୍ତୁ ।
- ମୁଣ୍ଡ ଓ ଦେହରେ ଓଦା ଗାମୁଛା ପକାନ୍ତୁ ।
- ନିଶାଖାଇ ଟାଣ ଖରାକୁ ବାହାରିଲେ ଜୀବନ ପ୍ରତି ବିପଦ ଥାଏ ।
- ଅଂଶୁଘାତ ରୋଗୀ ଦେହରେ ବରଫ ଘଷନ୍ତୁ ନାହିଁ ।

ସରକାରୀ ଡ଼ାକ୍ତରଖାନାରେ ଅଂଶୁଘାତ ରୋଗୀଙ୍କ ଚିକିତ୍ସା ପାଇଁ ସୁବିଧା କରାଯାଇଛି ।

ସ୍ୱାସ୍ଥ୍ୟ ଓ ପରିବାର କଲ୍ୟାଣ ବିଭାଗ, ଓଡ଼ିଶା ସରକାର

ପ୍ରସ୍ତୁତି : ରାଜ୍ୟ ସ୍ୱାସ୍ଥ୍ୟ ଓ ପରିବାର କଲ୍ୟାଣ ପ୍ରତିଷ୍ଠାନ, ଓଡ଼ିଶା

ଅଂଶୁଘାତ ପ୍ରତି ସତର୍କ ରୁହନ୍ତୁ

କ'ଣ କରିବା ଉଚିତ୍ !

- ଦିନ ୧୧ ଟାରୁ ୩ଟା ଭିତରେ ଖରାର ତାତି ସବୁଠାରୁ ଅଧିକ ଥାଏ । ଏଣୁ ଟାଣ ଖରାରେ ପଦାକୁ ବାହାରନ୍ତୁ ନାହିଁ ।
- ଆବଶ୍ୟକ ସ୍ଥଳେ ବାହାରକୁ ଯିବାକୁ ହେଲେ ମୁଣ୍ଡକୁ ଓଦା ଗାମୁଛାରେ ଘୋଡାନ୍ତୁ ଏବଂ ଛତା, ଯୋତା ଓ କଳା ଚଷମା ବ୍ୟବହାର କରନ୍ତୁ ଓ ସାଥିରେ ଥଣ୍ଡାପାଣି ନିଅନ୍ତୁ ।
- ବାହାରକୁ ଯିବା ଆଗରୁ ଓ ପହଞ୍ଚିବା ପରେ ସୁରେଇ, ମାଠିଆ ଓ ଘୁମ ଆଦିରେ ଥିବା ପାଣି, ଲେମ୍ବୁ ସରବତ, ଘୋଳଦହି, ଲୁଣ ମିଶା ତୋରାଣି ପିଅନ୍ତୁ ।
- ଶରୀରରେ ବାୟୁ ଚଳାଚଳ ପାଇଁ ସୂତା ଲୁଗା ବ୍ୟବହାର କରନ୍ତୁ ।
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- ଘରେ ଟିଣ ଓ ଆଜବେଷ୍ଟସ ଛାତ ଥିଲେ ତା' ଉପରେ ନଡ଼ା ବିଛାନ୍ତୁ ।
- ଦେହରୁ ଅଧିକ ଝାଳବୋହିଲେ, ପାଟି ଅଠା ଅଠା ଲାଗିଲେ - ପ୍ରଚୁର ପାଣି, ଓ.ଆର.ଏସ୍, ଓ ପଣା ପିଅନ୍ତୁ ।

କ'ଣ କରିବା ଅନୁଚିତ୍ ! !

- ✗ ଟାଣ ଖରାରେ ଶାରିରୀକ ପରିଶ୍ରମ କରନ୍ତୁ ନାହିଁ ।
- ✗ ବୃଦ୍ଧ, ଅସୁସ୍ଥ ଲୋକ, ଶିଶୁ, ଗର୍ଭବତୀ ମହିଳା ଏବଂ ରକ୍ତଚାପ ଓ ମଧୁମେହରେ ପୀଡିତ ବ୍ୟକ୍ତି ଟାଣ ଖରାରେ ବାହାରକୁ ଯାଆନ୍ତୁ ନାହିଁ ।
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- ✗ କେହି ଅସୁସ୍ଥ ଅନୁଭବ କଲେ ତାଙ୍କର ଚିକିତ୍ସା ପ୍ରତି ଅବହେଳା କରନ୍ତୁ ନାହିଁ ।
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ଓ.ଆର.ଏସ୍ ପ୍ୟାକେଟ୍ ସମସ୍ତ "ଆଶା" ଅଙ୍ଗନୱାଡି କେନ୍ଦ୍ର, ସ୍ୱାସ୍ଥ୍ୟ ଉପକେନ୍ଦ୍ର, ସ୍ୱାସ୍ଥ୍ୟକେନ୍ଦ୍ର ଓ ସରକାରୀ ଡ଼ାକ୍ତରଖାନା ଗୁଡିକରେ ମାଗଣାରେ ମିଳେ । ସରକାରୀ ଡ଼ାକ୍ତରଖାନା ମାନଙ୍କରେ ଅଂଶୁଘାତ ରୋଗୀଙ୍କ ପାଇଁ ଚିକିତ୍ସାର ସୁବିଧା କରାଯାଇଛି ।

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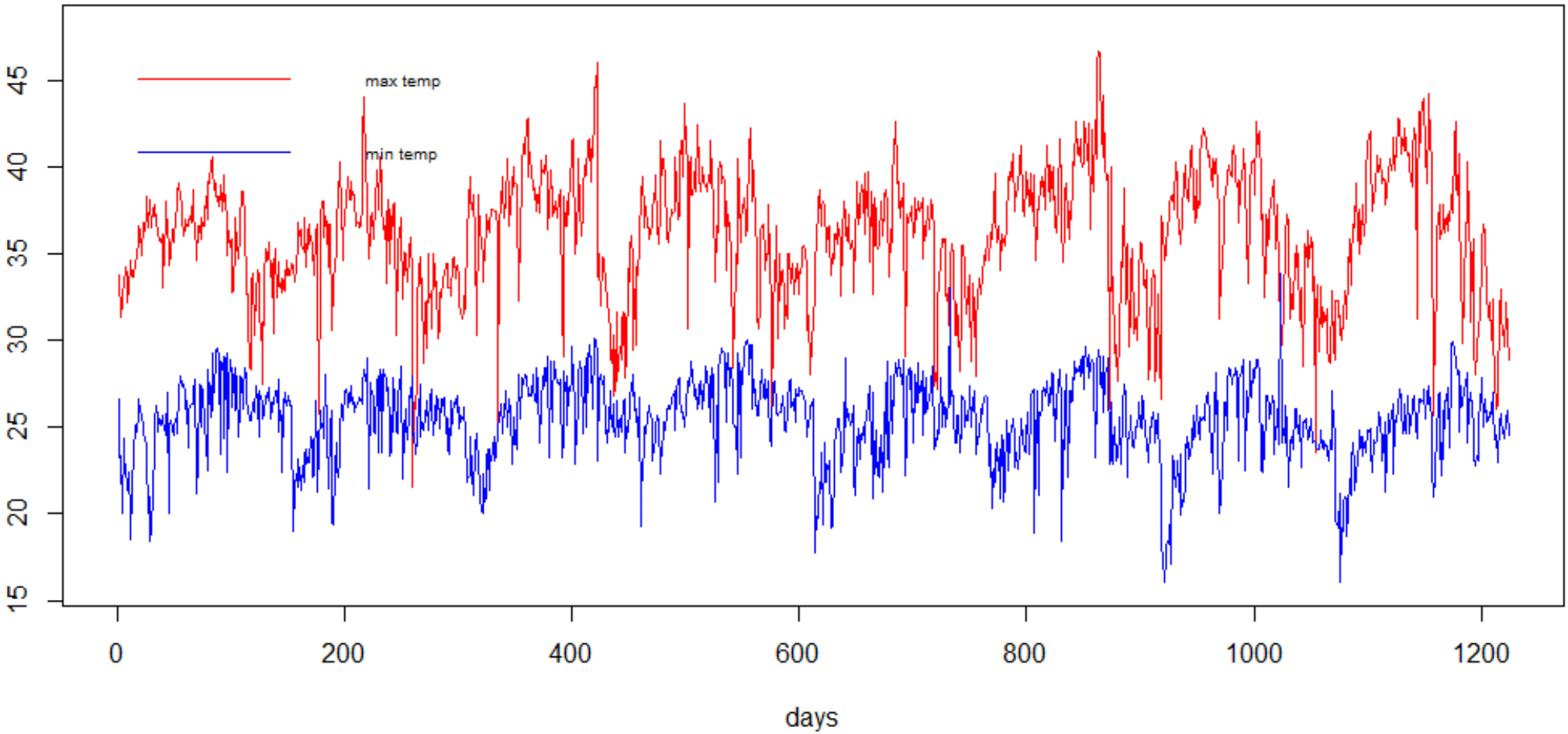
Determination of threshold values (trigger points)

Characterizing temperature-mortality relationship, Bhubaneswar, Odisha

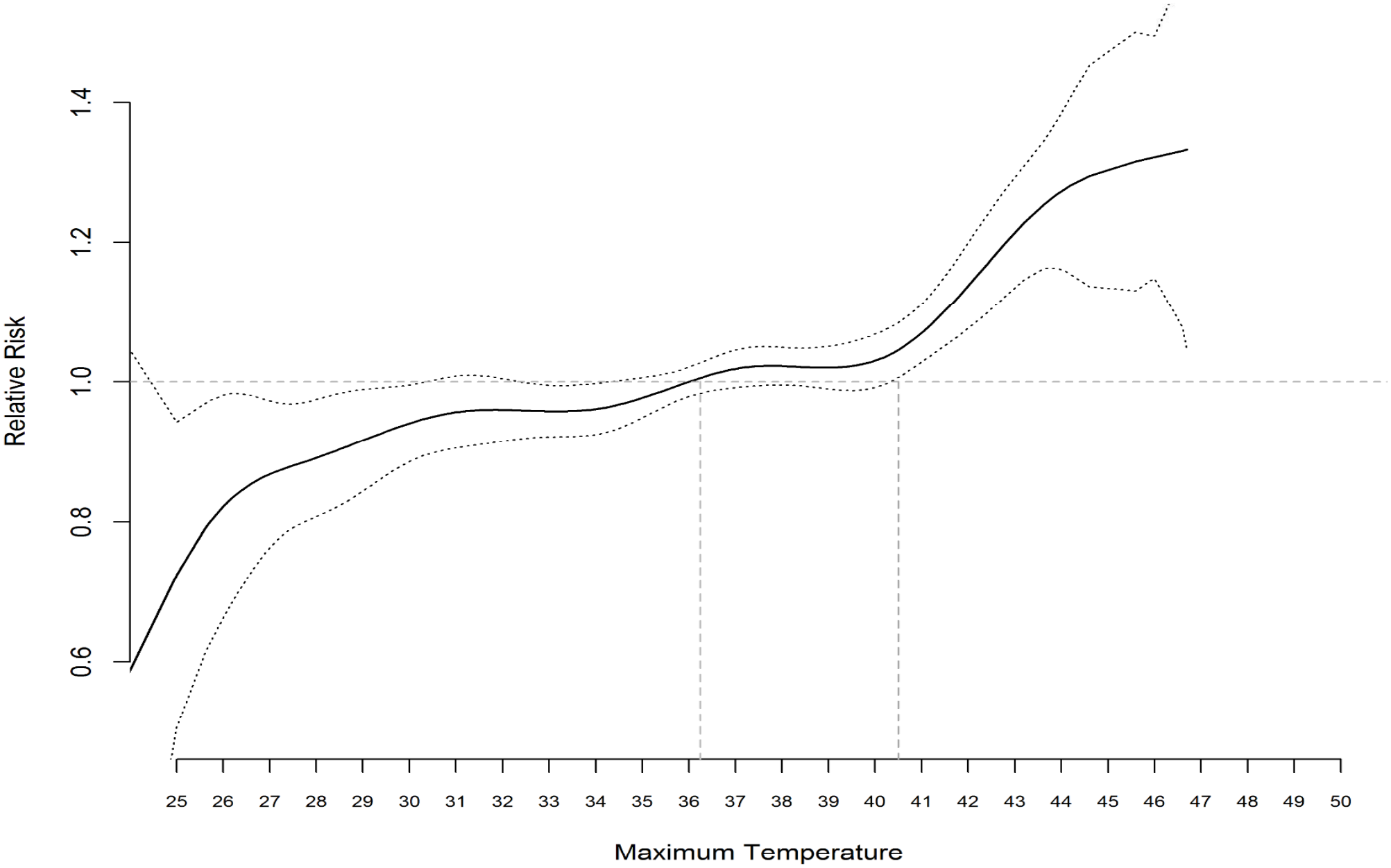
Temperature-mortality association

- City: Bhubaneswar
- Maximum temperature (T_{max}) is the exposure
- All-cause mortality is the outcome
- Time-series data collected
  - For the months of March to July
  - For the years 2007 to 2015

Max Min Temps (2008-2015, March to July)



Association between Maximum Temperature and All-cause Mortality, Bhubaneswar, 2008-2015

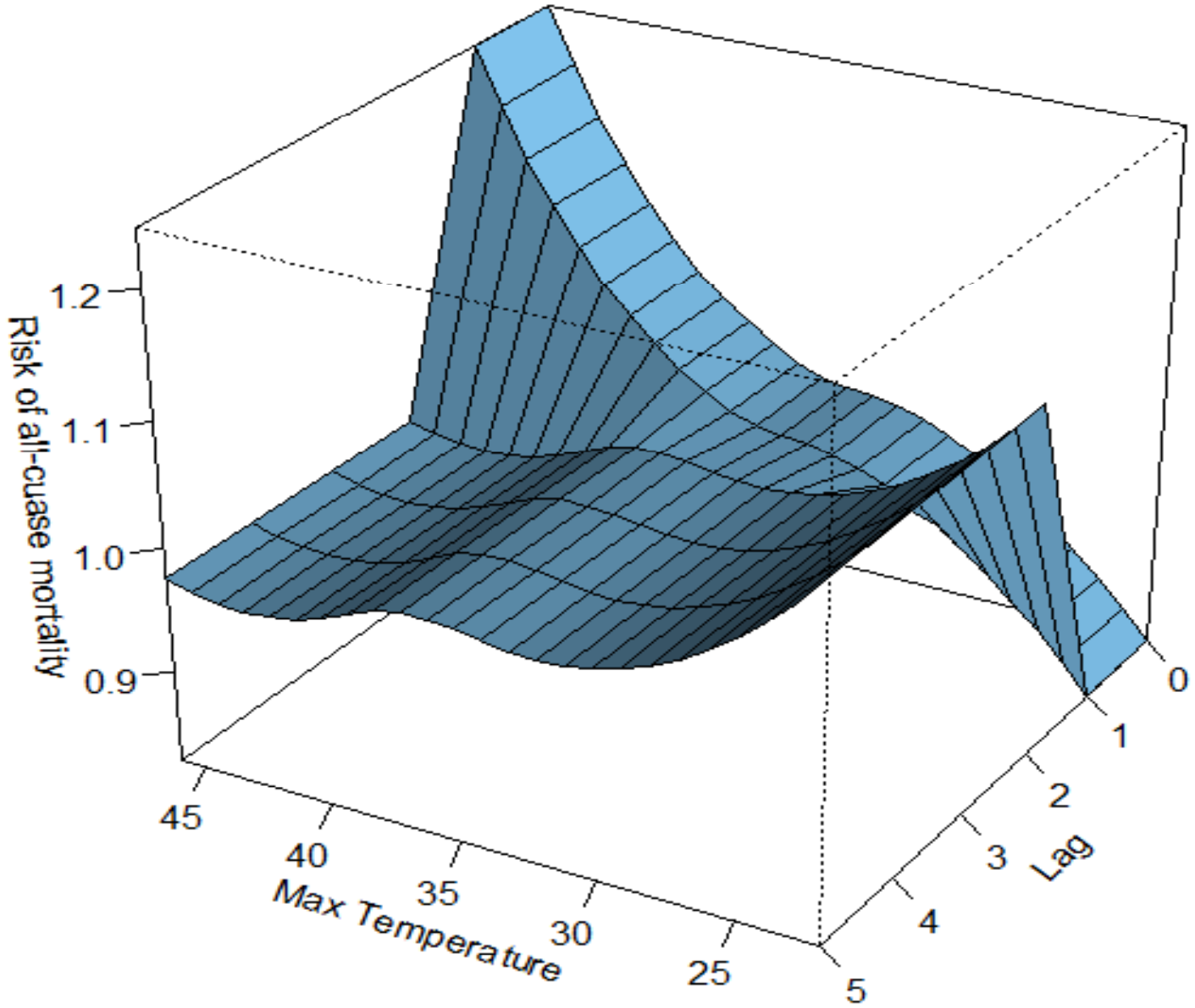


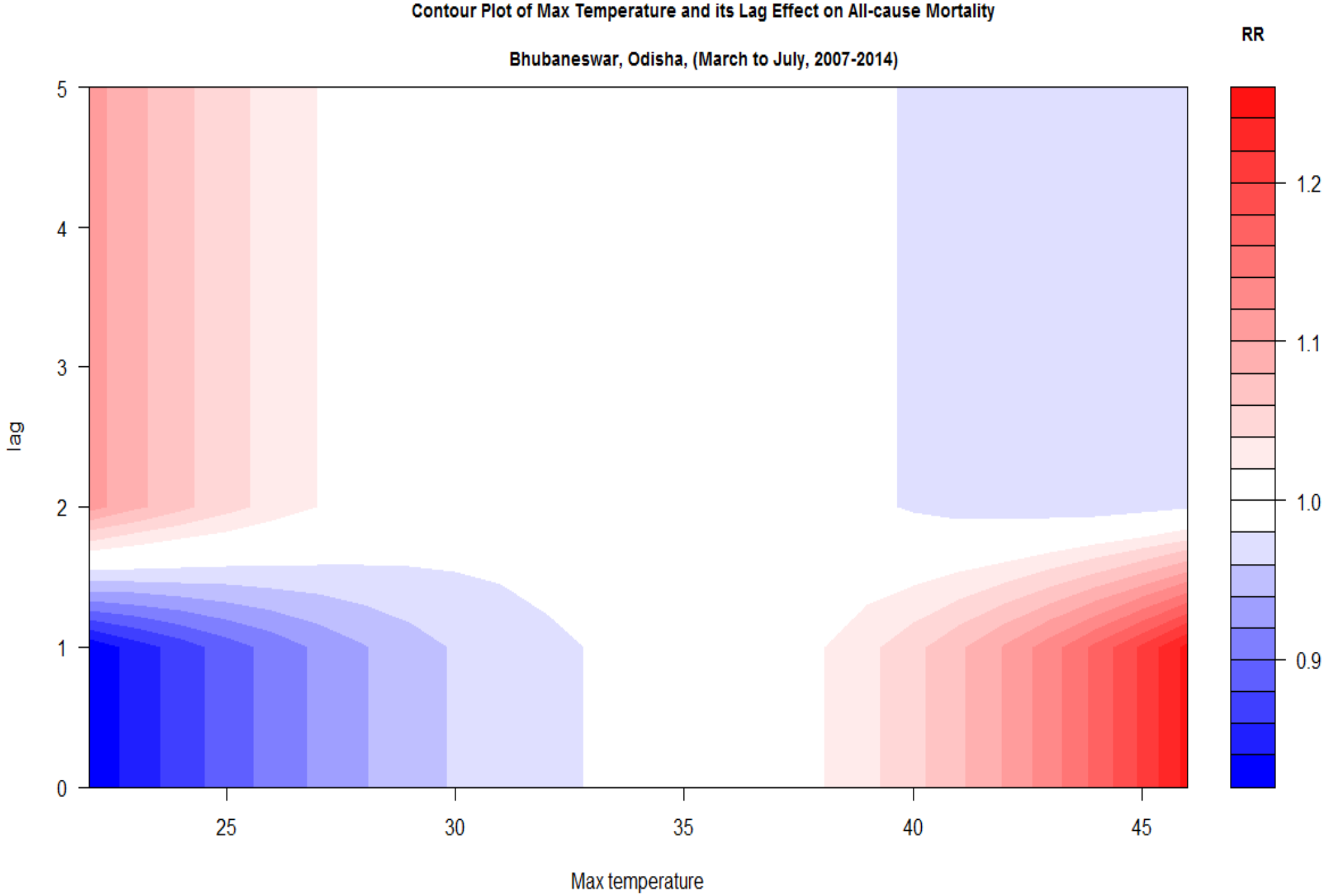
THE “LAG” AND THE “HARVESTING” EFFECT

Using three approaches

3D Graph of Temperature effect with Lags on All-Cause Mortality,

Bhubaneswar, Odisha (March to July of 2007-2014)




Contour Plot of Max Temperature and its Lag Effect on All-cause Mortality
Bhubaneswar, Odisha, (March to July, 2007-2014)
RR
1.2
1.1
1.0
0.9
lag
0
1
2
3
4
5
25
30
35
40
45
Max temperature

HEAT VULNERABILITY ASSESSMENT

Community Assessment

- Two cities (Cuttack and Bhubaneswar)
- 26 slums (13 from each cities) + 10 Non slum
- 766 Households (306 Slum HHs + 460 Non slum HHs)
- Information was collected for 1009 Individuals
- Mostly covered people staying indoor (ladies not working, aged people, children, students and disease person in the family if any)

Data Collection

Tool was developed in Odia and piloted before the use

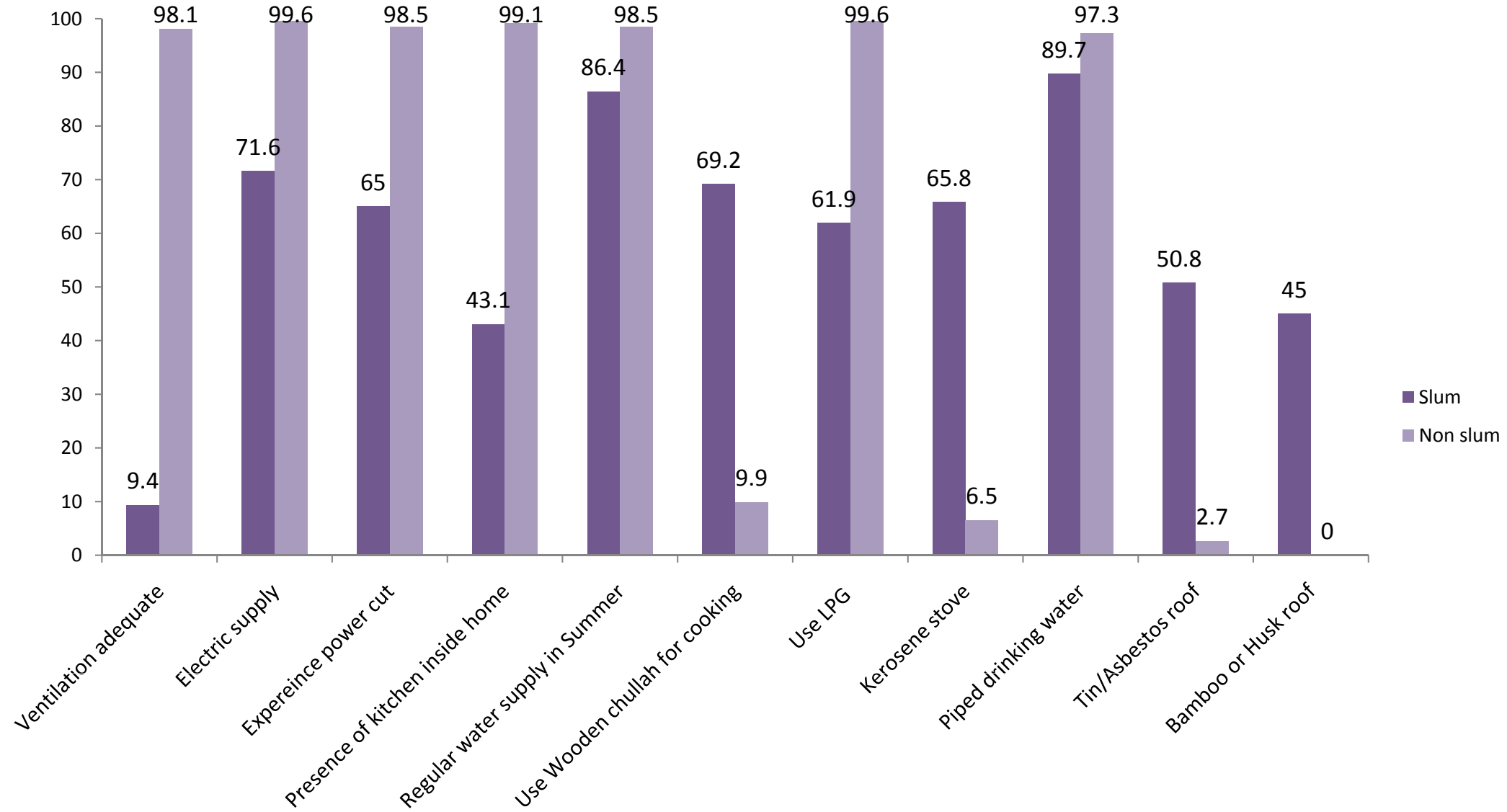
Individual Information

1. Demographic
2. Health Conditions
3. Previous Exposure to heat illness
4. Occupation
5. Healthcare utilization during heat illness

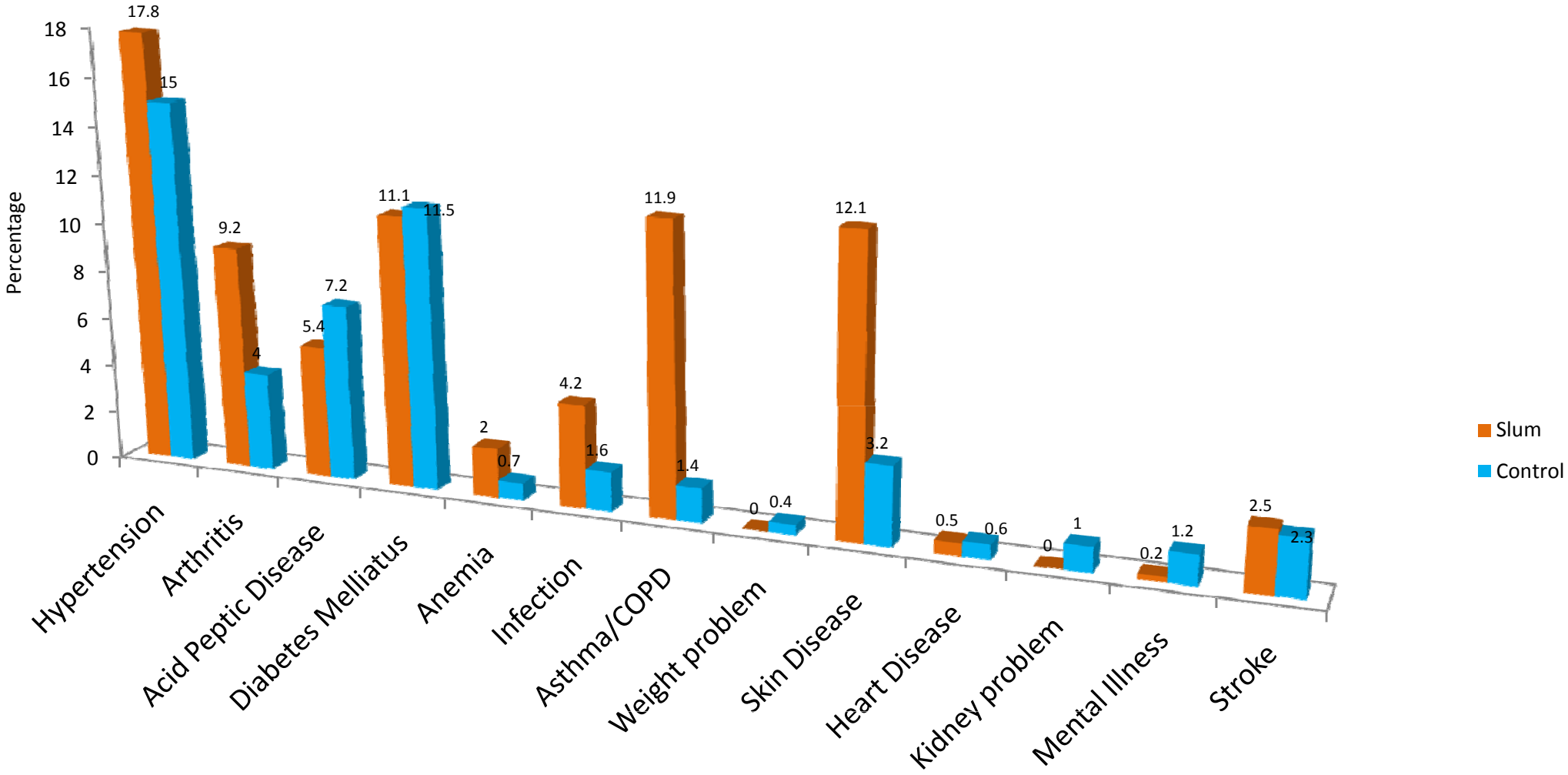
Household Information

1. Housing structure
2. Cooking Fuel
3. Water supply
4. Adaptive Mechanism during Summer

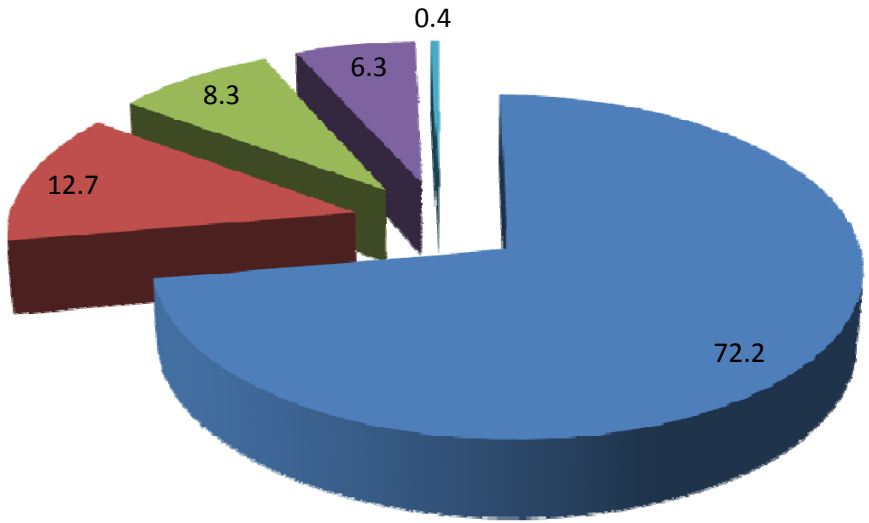
Housing Condition



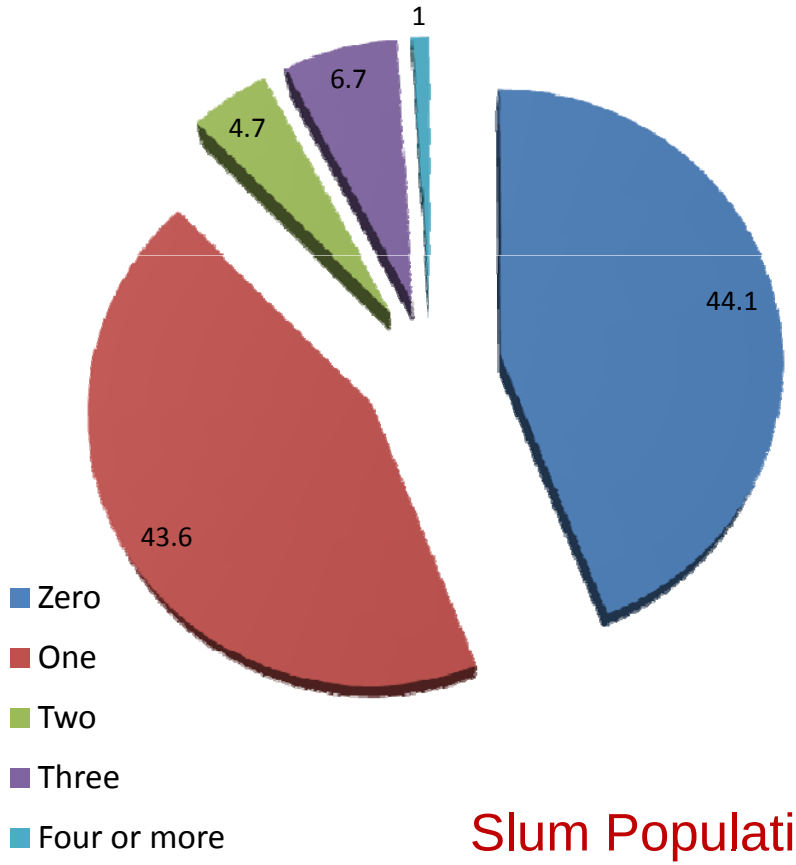
Morbidity Status



Number of conditions present per person

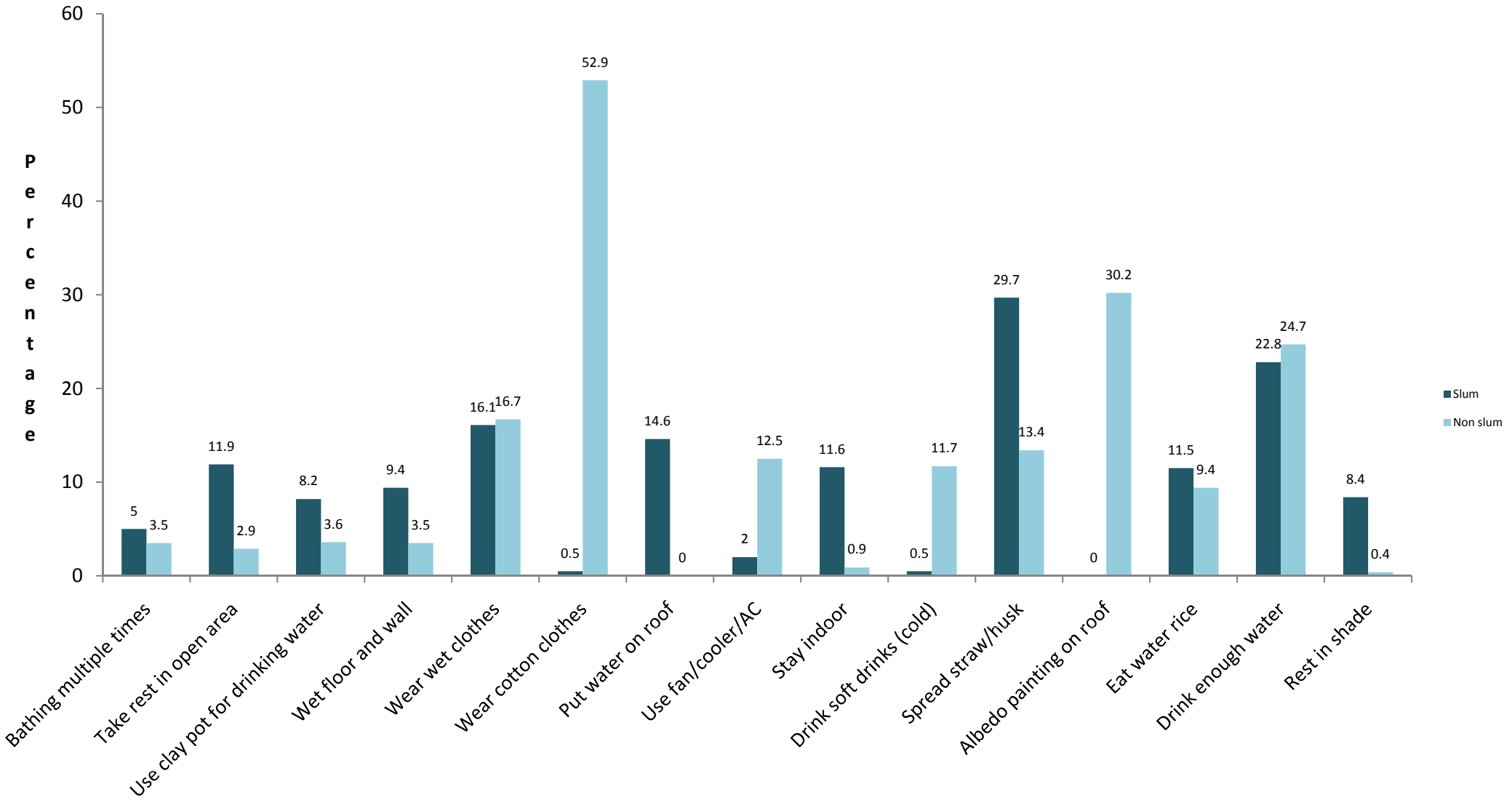


Non- Slum Population

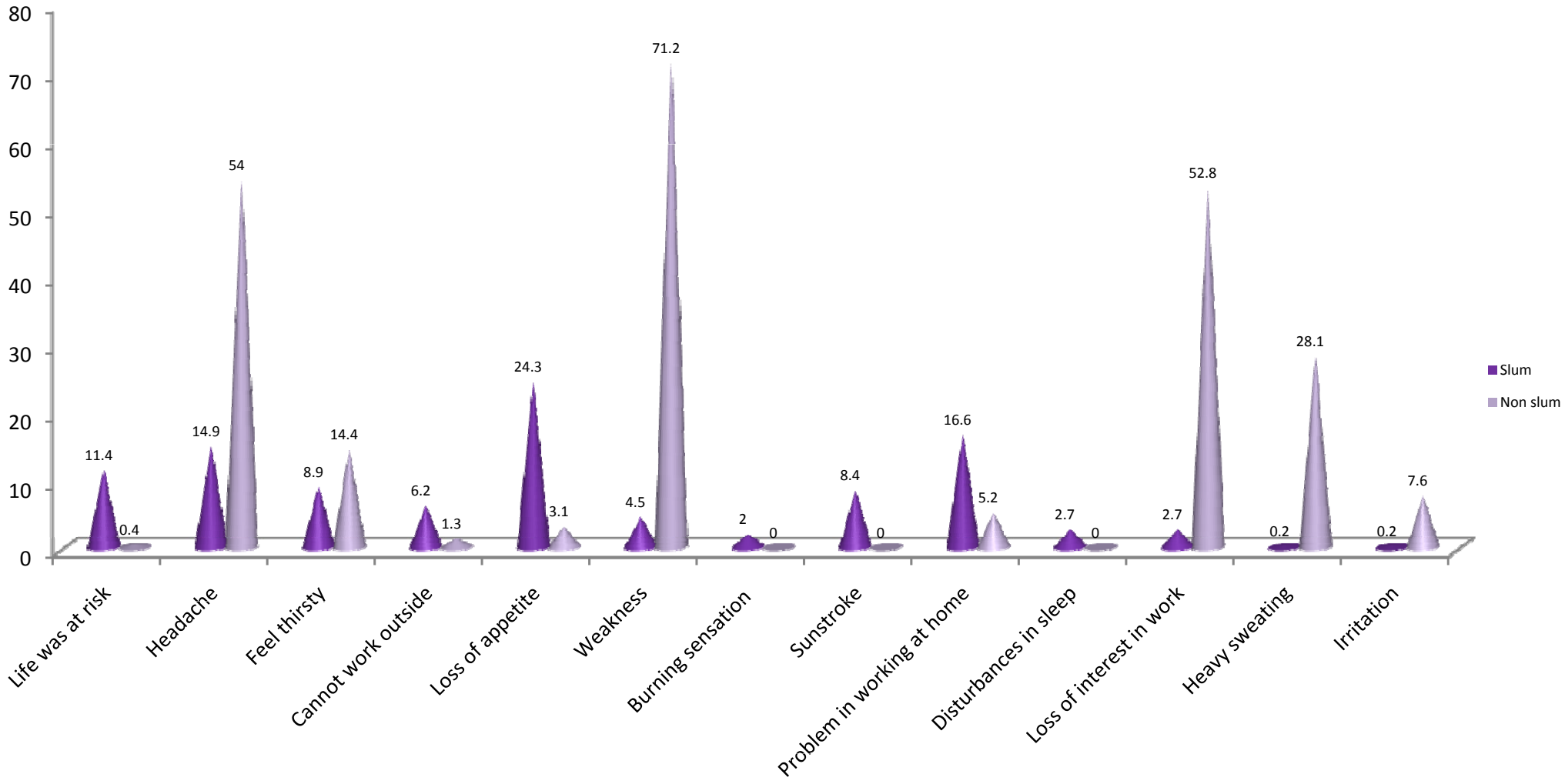


Slum Population

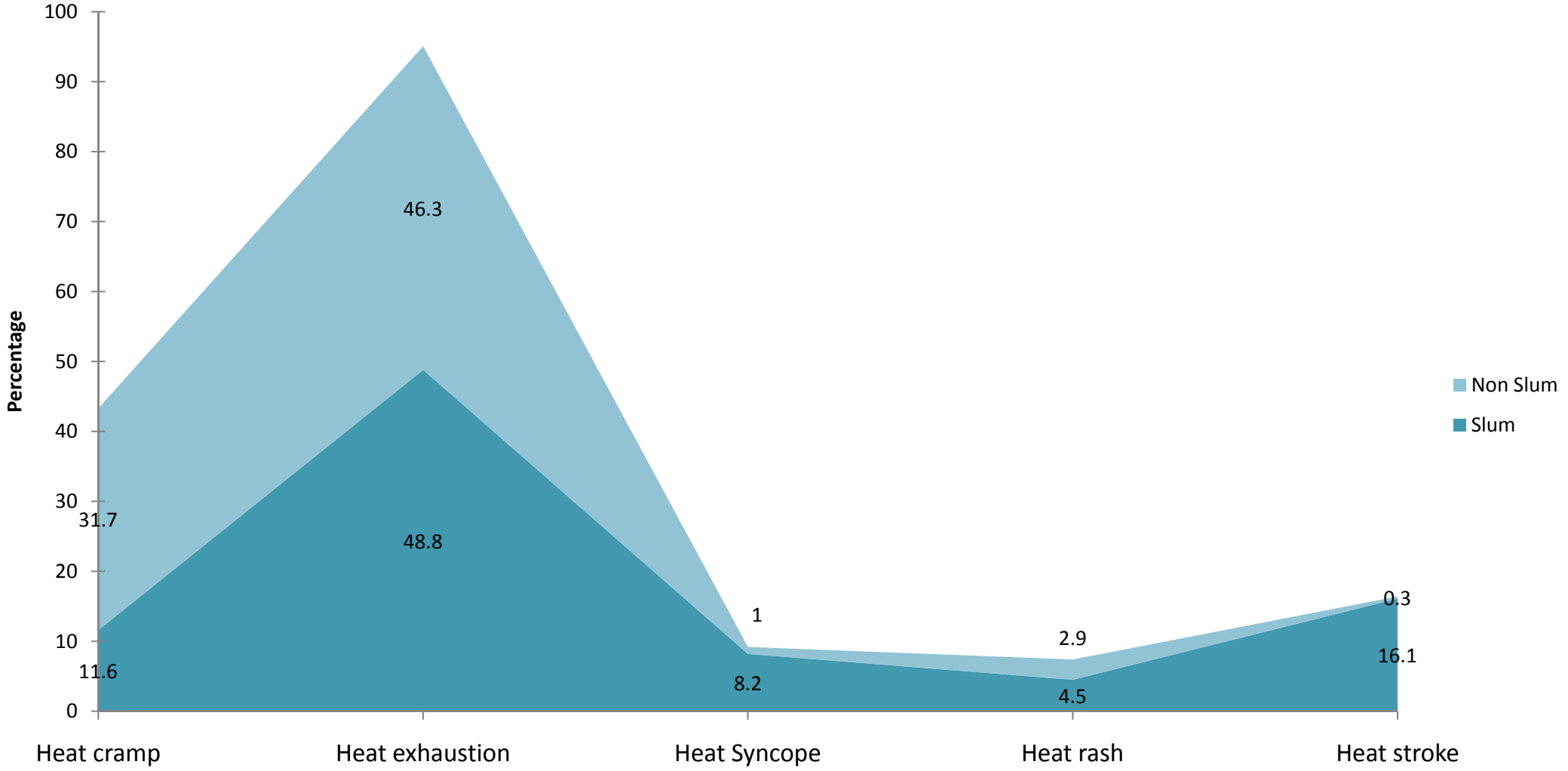
Practices During Summer



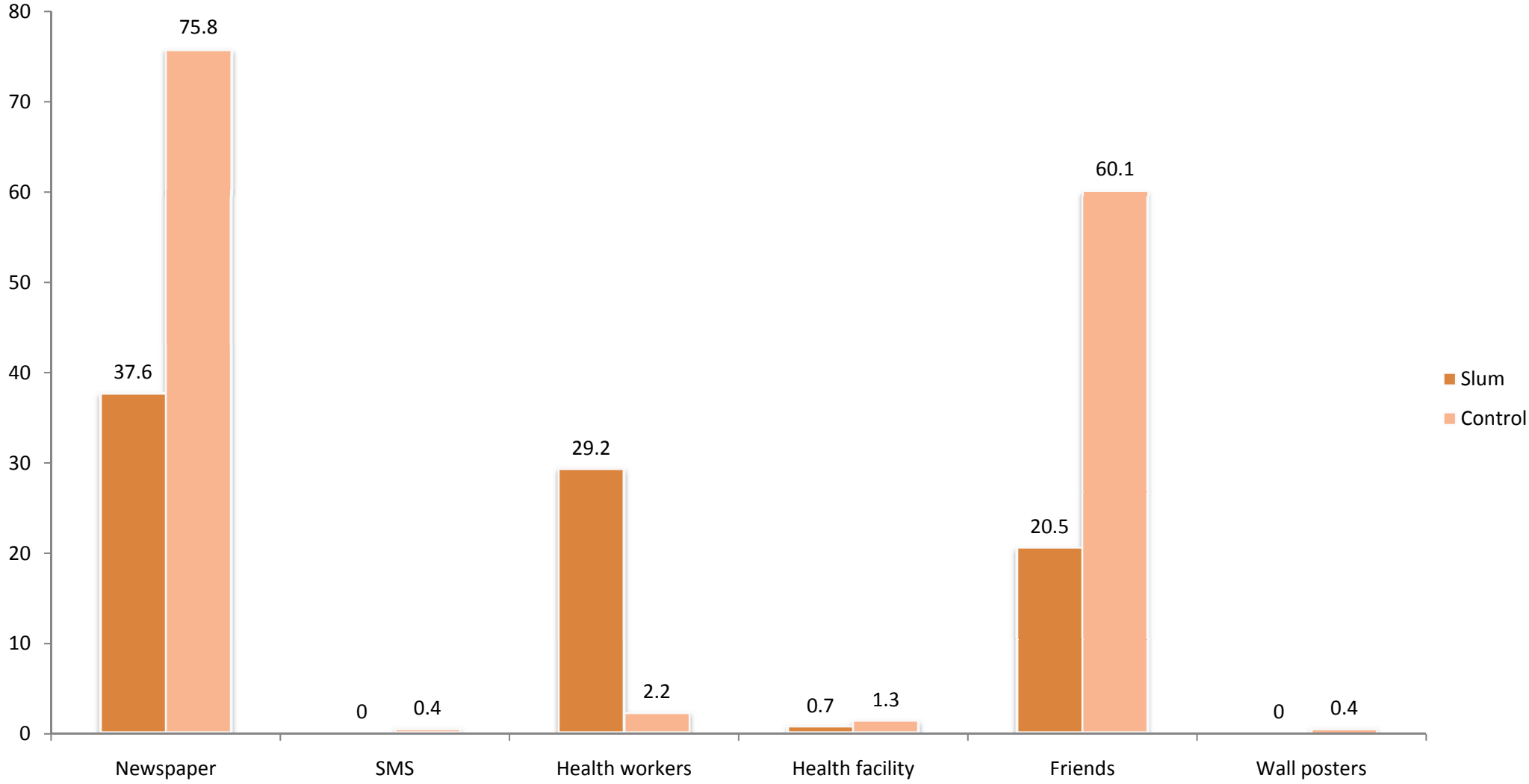
Problems faced during summer



Heat related illness episodes (last three years)



Sources of Information on Heat Wave



Findings

- Multiple logistic regression was done using GEE (general equation estimate) method to account the clustering of data.
- **Males** staying indoor were **two times higher at risk** of getting heat illness compared to females
- **Presence of kitchen outside** the home makes the residents **two times** more vulnerable towards the heat exposure and illness
- Presence of **chronic conditions** predisposes higher risk **(2-4 times)** of getting heat illness
- **Practice of cooling methods** like use of fan/ac/cooler **decreases the chance of getting heat illness by 60%**

Target specific Recommendations

- Effective Communication strategies
- Informational Pamphlets – for specific groups
- Drinking water supply
- Shelter home provision
- Public access to cool places
- Changing of cooking fuel pattern

- Chronic diseases and medication – more qualitative research

Suggestions for policy….

- Public transport instead of using bike/cycle
- Travel timing to office not be between 12 noon-3pm
- Public bus stops with water facility
- ‘First aid’ training of the drivers, conductors, students and others
- Senior citizen, sick people to have an identity card
- Promote water consumption and ‘not carbonated drinks’
- All public transportation to have cold water, ice box and first aid box
- Plantation of trees on road side and at major public stoppages
- First aid box should have two components: Medical and Stroke related

At Workplace

- Change of working time (if possible); encourage shift duty; timing of lunch; provision of canteen at workplace
- Provide water, ice box and ‘first aid’ at workplace. Protective measures to be used during working
- Work station redesign. Shift heavy work station from top floor
- Adequate ventilation and cooling mechanism
- Creation of heat resistant building instead ‘tin roofed’ vending zones.
- Periodic health status check – those working in direct sun
  Discourage heavy manual works during mid day. ‘Shifting in working time’??
- Plantation and creation of green environment at workplace.

Broader policy aspect

- Specific Do's and Don'ts for key occupation groups has to be developed and shared
- Including the associations/trade leaders/construction site supervisors in heat wave sensitization trainings and meetings

Way forward

- Need to carry out threshold assessments every year
- More in-depth analysis to understand cause of low mortality thresholds for Odisha ?
- Develop composite index
- Work with NREGA/RD – alternative livelihoods
- Better data – Mortality, Morbidity, Heat
- Comparative analysis – Odisha, Gujrat, Maharashtra, Karnataka, Telengana, AP
- Robust evaluation of the HAP implementation

Thank you!!!