What is data visualization ?

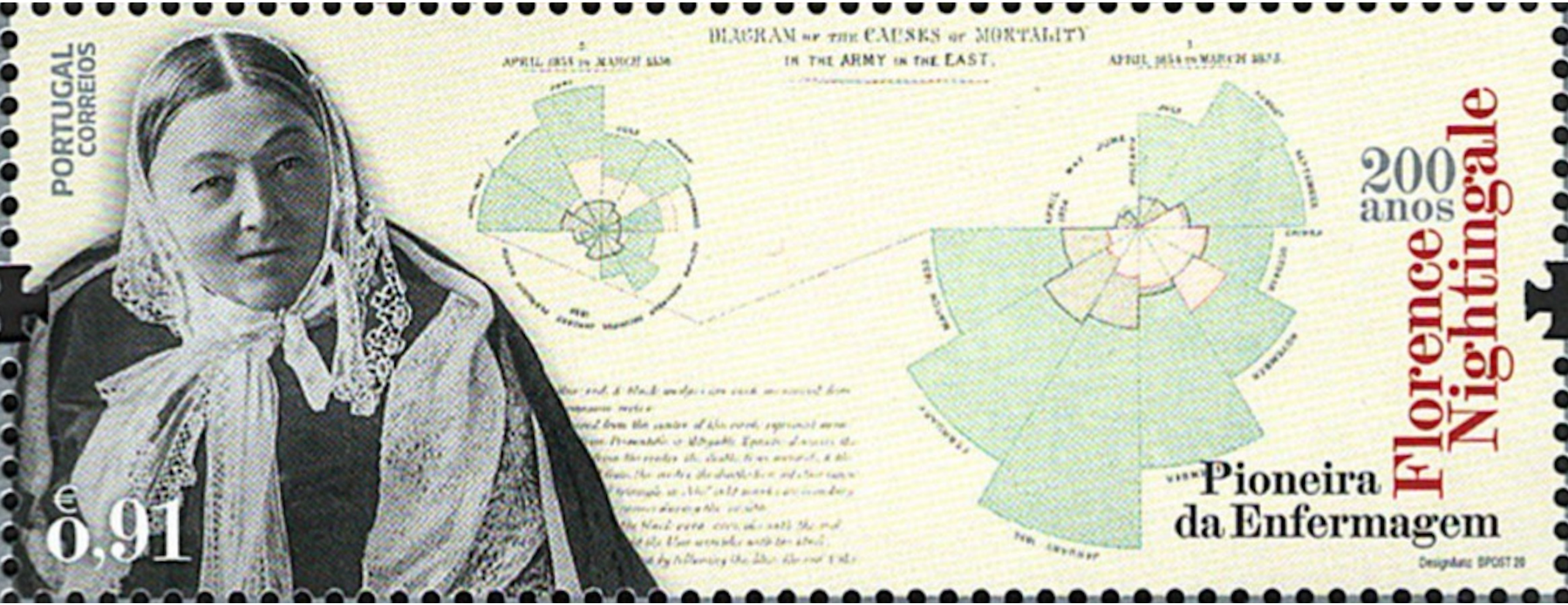
Impact of a visual

Visuals have a greater appeal, rather than numbers

Single visual tells entire story

Impactful visuals are powerful tools in dissemination and advocacy

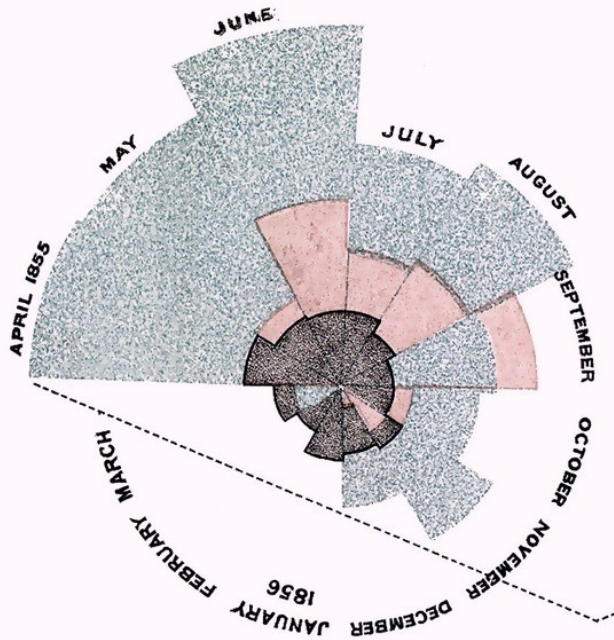
Some visuals have had a lasting impact in history of public health



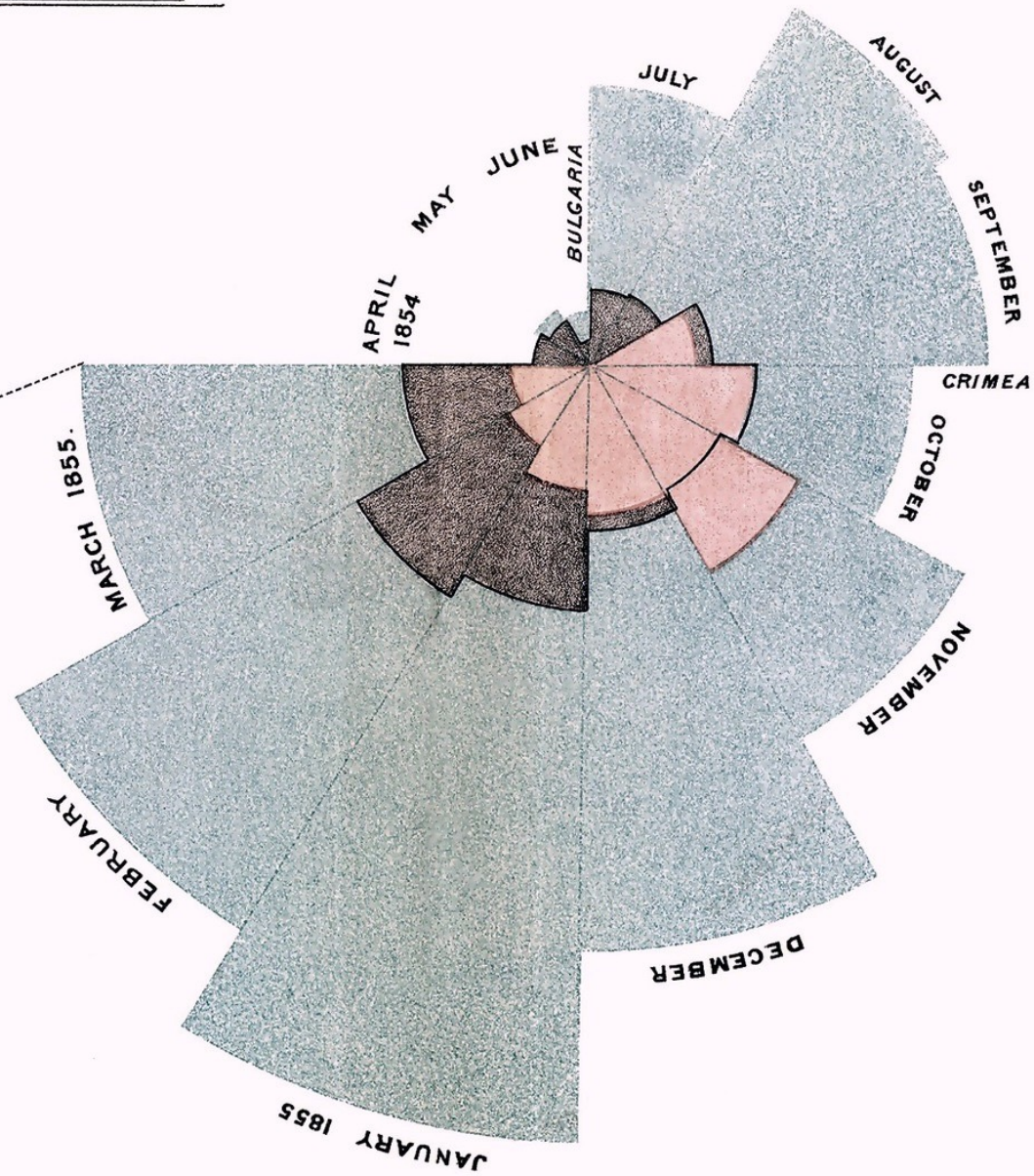
Postage stamp, Portugal 2020

DIAGRAM of the CAUSES of MORTALITY IN THE ARMY IN THE EAST.

2.
APRIL 1855 to MARCH 1856.



1.
APRIL 1854 to MARCH 1855.



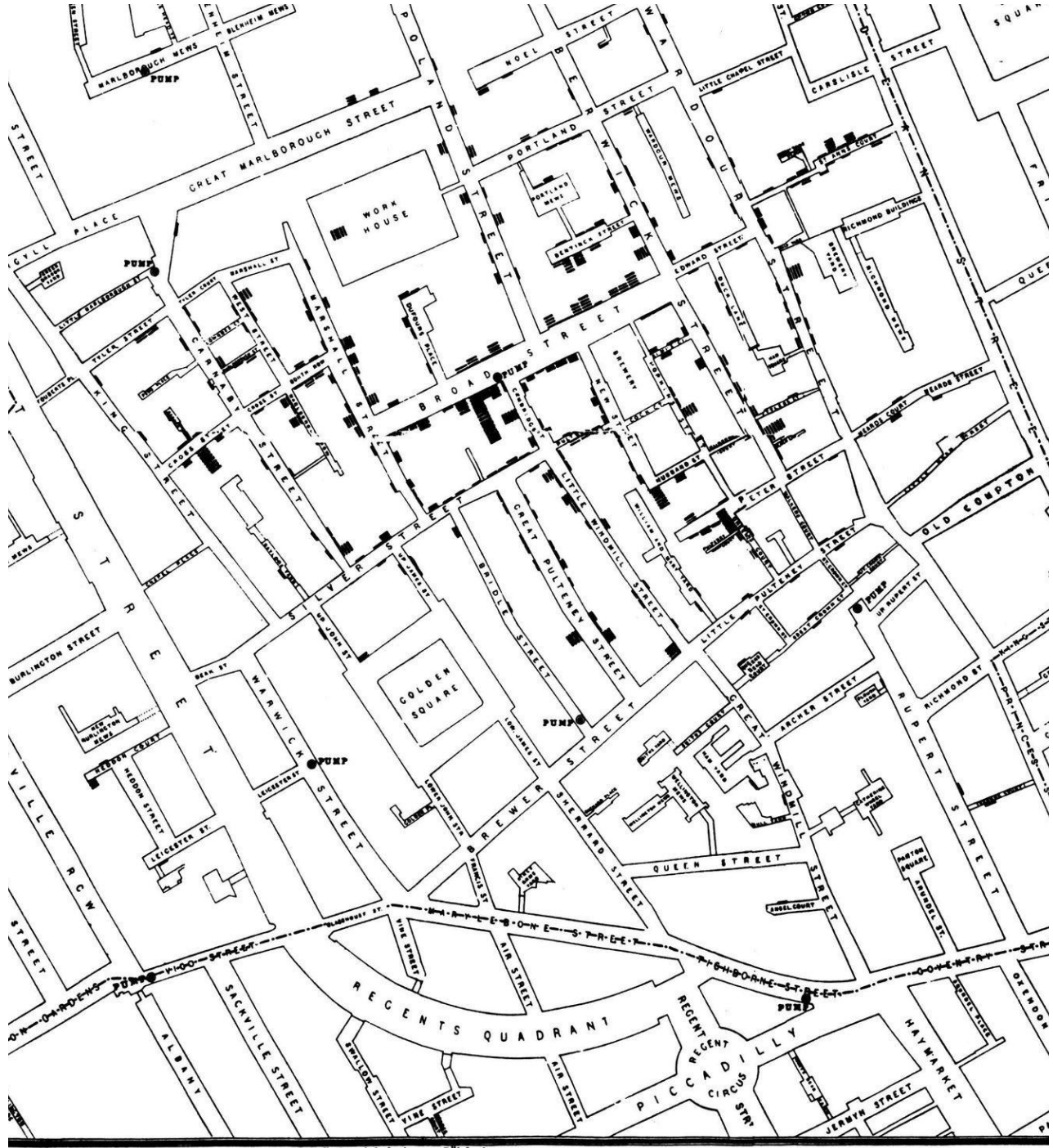
The Areas of the blue, red, & black wedges are each measured from the centre as the common vertex.

The blue wedges measured from the centre of the circle represent area for area the deaths from Preventible or Mitigable Zymotic diseases, the red wedges measured from the centre the deaths from wounds, & the black wedges measured from the centre the deaths from all other causes.

The black line across the red triangle in Nov.r 1854 marks the boundary of the deaths from all other causes during the month.

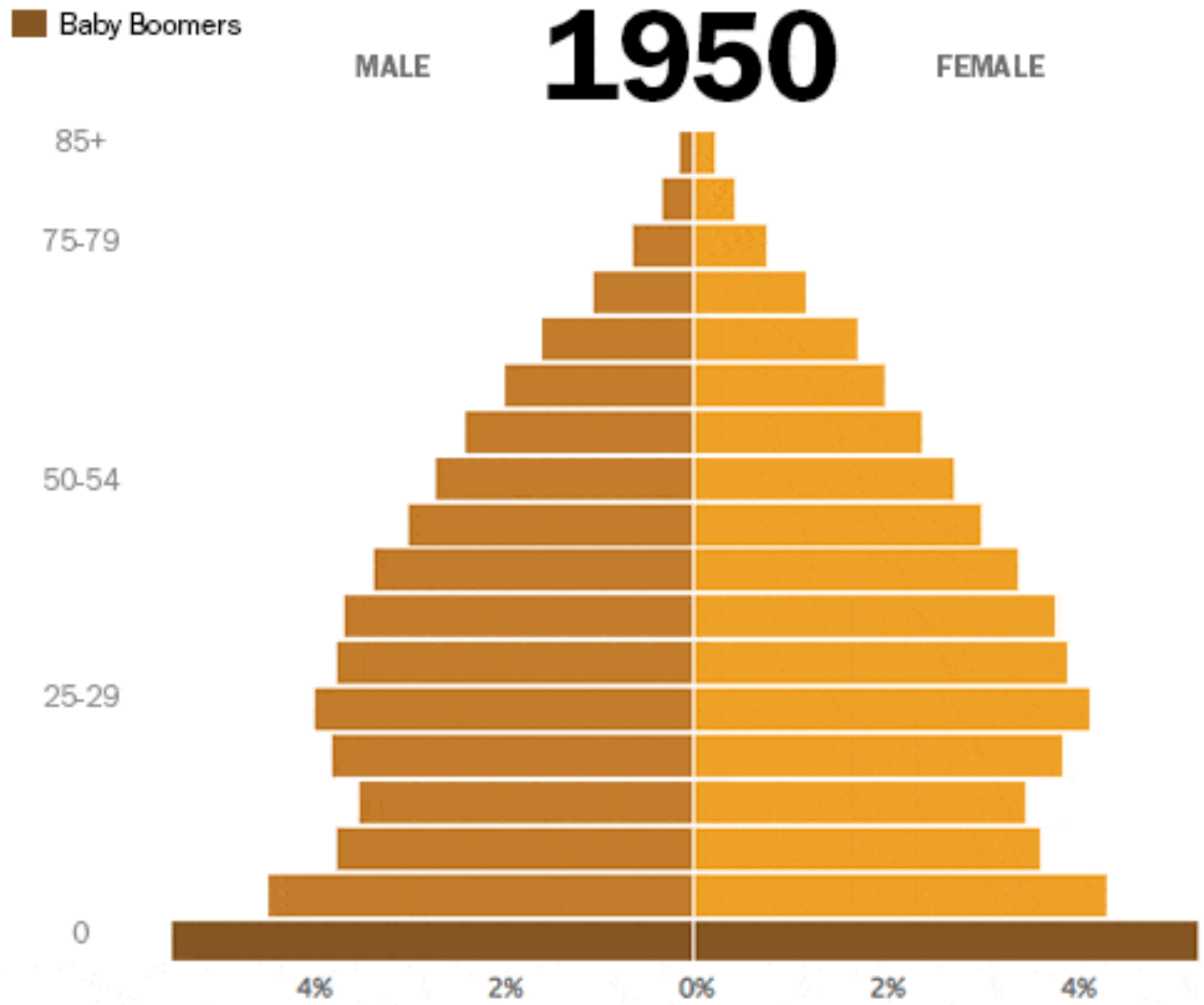
In October 1854, & April 1855, the black area coincides with the red; in January & February 1856, the blue coincides with the black.

The entire areas may be compared by following the blue, the red & the black lines enclosing them.


GREAT MARLBOROUGH STREET
PUMP
MARLBOROUGH MEWS
POLAND STREET
NOEL STREET
WARDOUR STREET
LITTLE CHAPEL STREET
CARLISLE STREET
PORTLAND STREET
WORK HOUSE
PORTLAND MEWS
BERNERS STREET
RICHMOND BUILDINGS
EDWARD STREET
BEAK STREET
REGENT STREET
BROAD STREET
PUMP
BROWER STREET
MARSHALL ST
TYLER STREET
CARNABY STREET
KINGLY STREET
FOUBERT'S PL.
GREAT PULTENEY STREET
LITTLE PULTENEY STREET
PETER STREET
OLD COMPTON
BEARDS COURT
BEARDS STREET
BRIDLE STREET
LITTLE WINDMILL STREET
GOLDEN SQUARE
BURLINGTON STREET
NEW BURLINGTON MEWS
HEDDON COURT
HEDDON STREET
LEICESTER ST.
WARWICK STREET
LOWER JOHN ST.
SHERRARD STREET
QUEEN STREET
ARCHER STREET
RUPERT STREET
RICHMOND ST
WINDMILL
ANGEL COURT
REGENTS QUADRANT
VINE STREET
AIR STREET
SACKVILLE STREET
ALBANY
SWALLOW STREET
REGENT CIRCUS
PICCADILLY
HAYMARKET
JERMYN STREET
OXENDON
C. F. Cheffins, Lith. Southampton Bldgs. London.
SCALE 30 INCHES TO A MILE.

NEXT AMERICA

Percent of U.S. Population by Age Group, 1950-2060



PEW RESEARCH CENTER

Cognitive steps in data visualization

- A study is completed
- Data is analyzed
- Results are tabulated

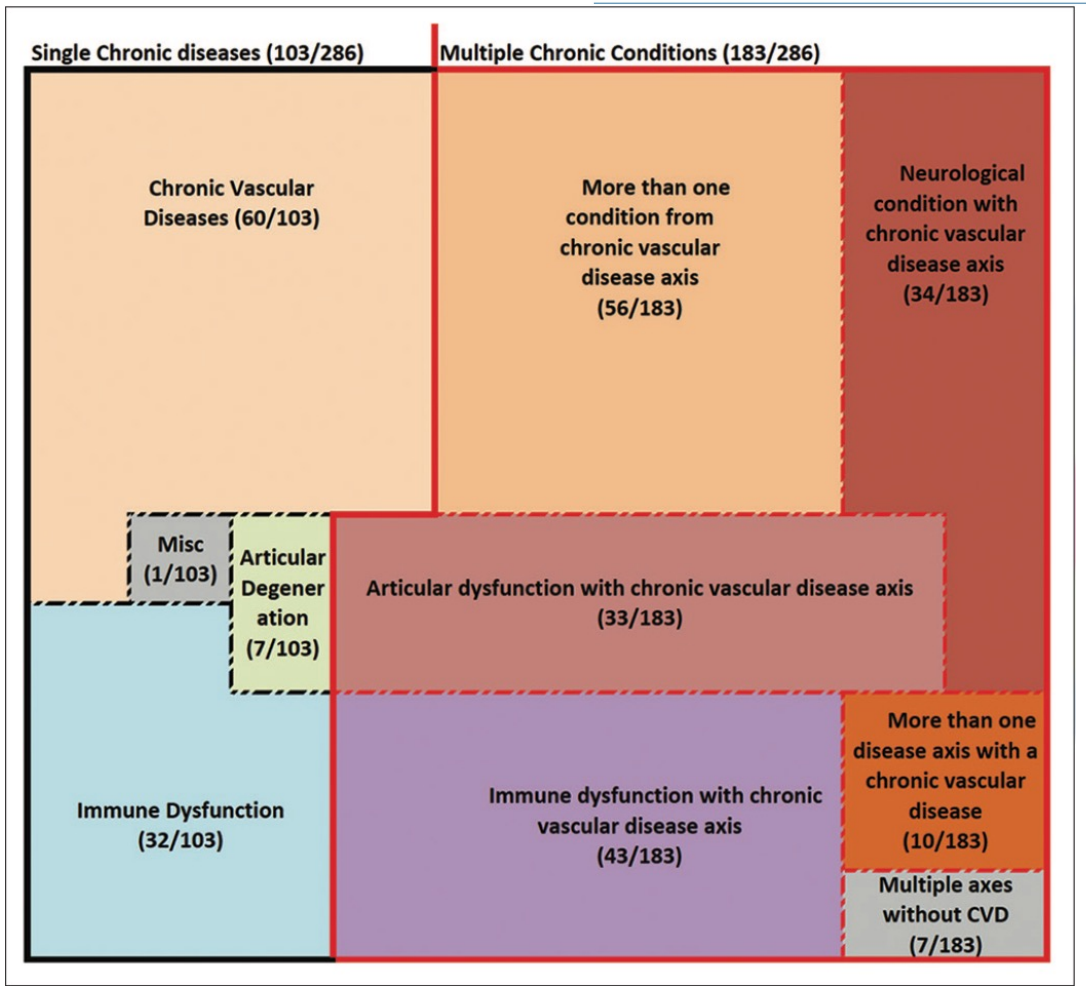
- What is the key message we want to give ?
- What will be a single visual for this message ?

Original Article

Prevalence and Patterns of Coexistence of Multiple Chronic Conditions: A Study from Indian Urban Outpatient Setting

Rajnish Joshi[1], John A. Santoshi[2], Nirendra Rai[3], Abhijit Pakhare[4]

[1]Departments of Medicine, [2]Orthopedics, [3]Neurology, [4]Community and Family Medicine, All India Institute of Medical Sciences, Bhopal, Madhya Pradesh, India



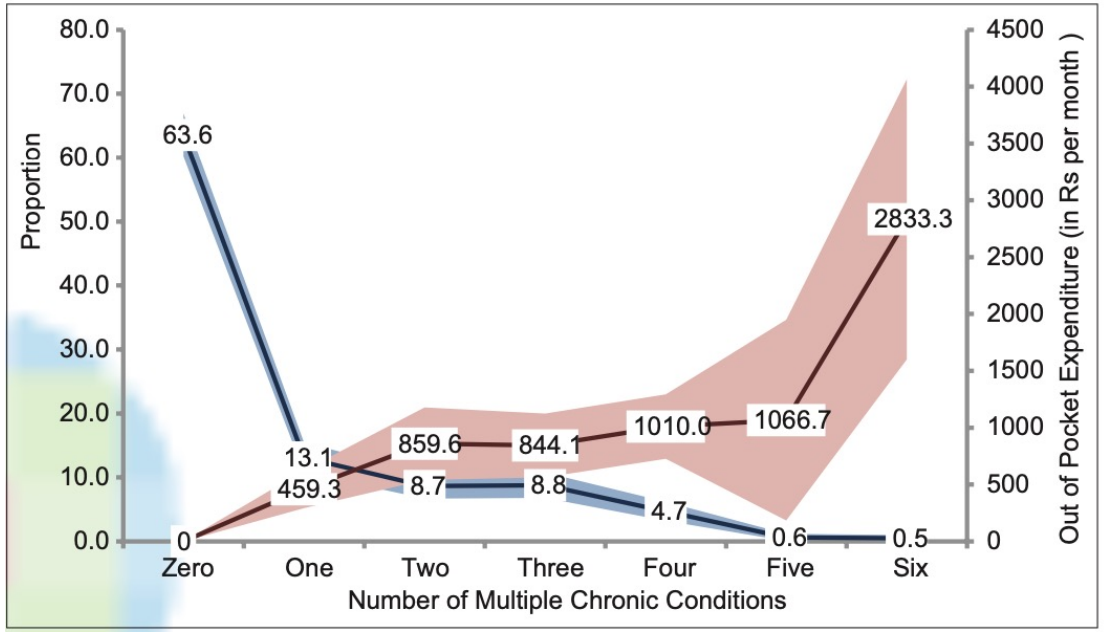


Figure 2: Prevalence and out-of-pocket expenditure for one or more chronic coexisting conditions. Proportion of multiple chronic conditions (blue line) and its 95% confidence interval (blue shaded area) shows a decreasing trend (Chi-square goodness of fit test (chi square 1609.6, df 6, $P < 0.0001$). Increasing trend for out-of-pocket expenditure in rupees (red line) and its 95% confidence interval was statistically significant (ANOVA $P < 0.001$)

RESEARCH ARTICLE Open Access

Assessment of primary care facilities for cardiovascular disease preparedness in Madhya Pradesh, India

Abhijit Pakhare[1], Sanjeev Kumar[1], Swati Goyal[2] and Rajnish Joshi[3*]

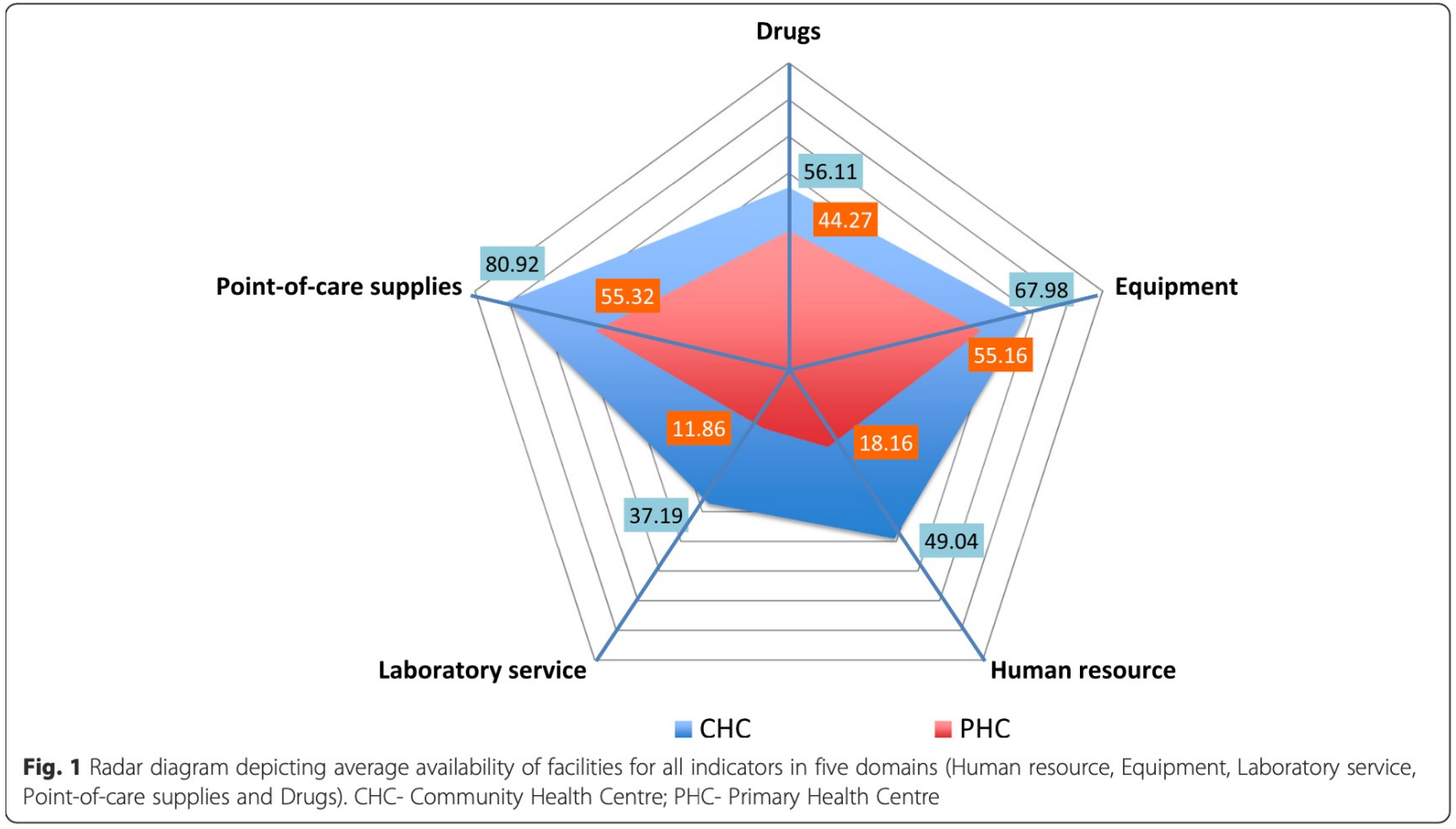
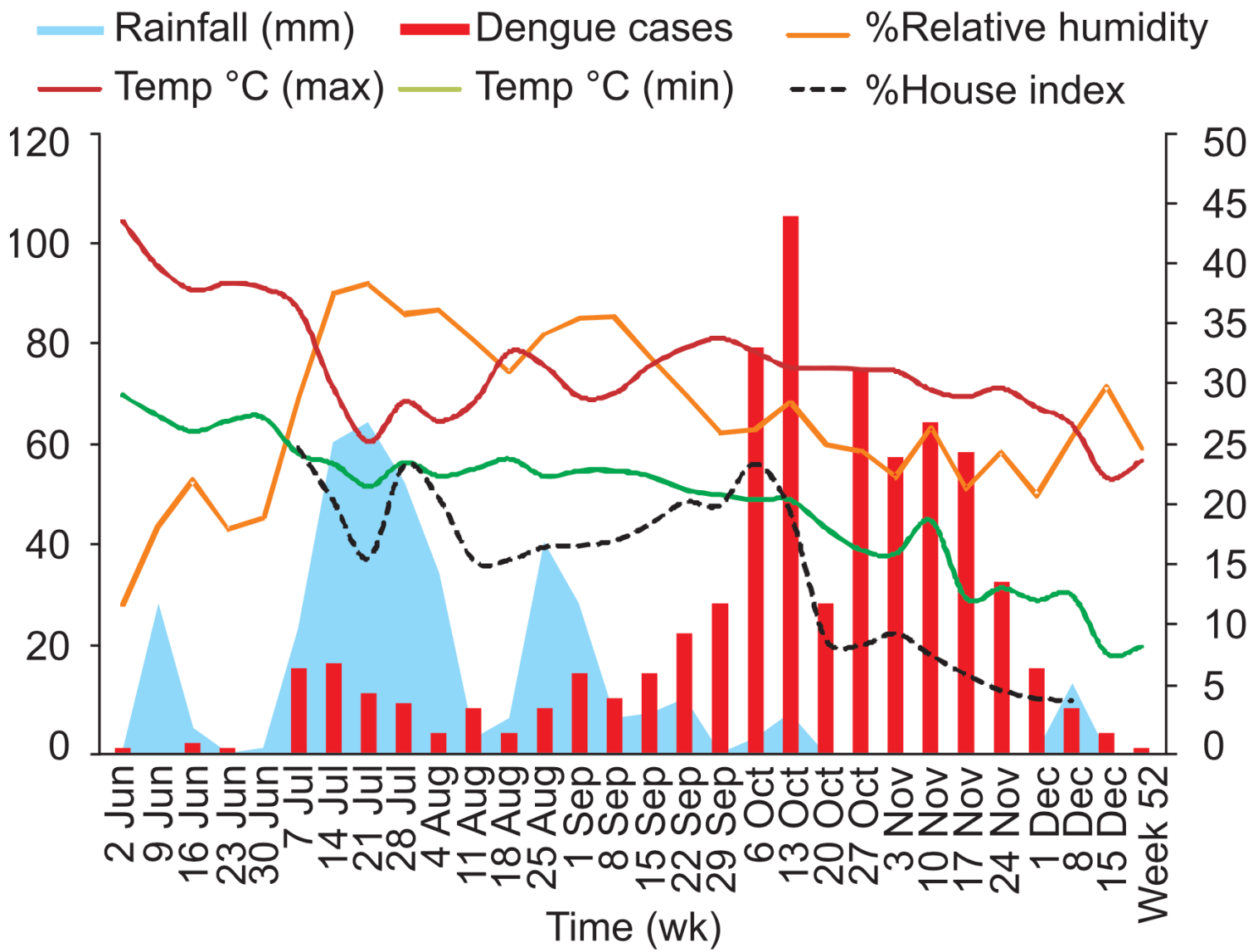


Fig. 1 Radar diagram depicting average availability of facilities for all indicators in five domains (Human resource, Equipment, Laboratory service, Point-of-care supplies and Drugs). CHC- Community Health Centre; PHC- Primary Health Centre

BMC Health Services Research, 2015

A study of spatial and meteorological determinants of dengue outbreak in Bhopal City in 2014

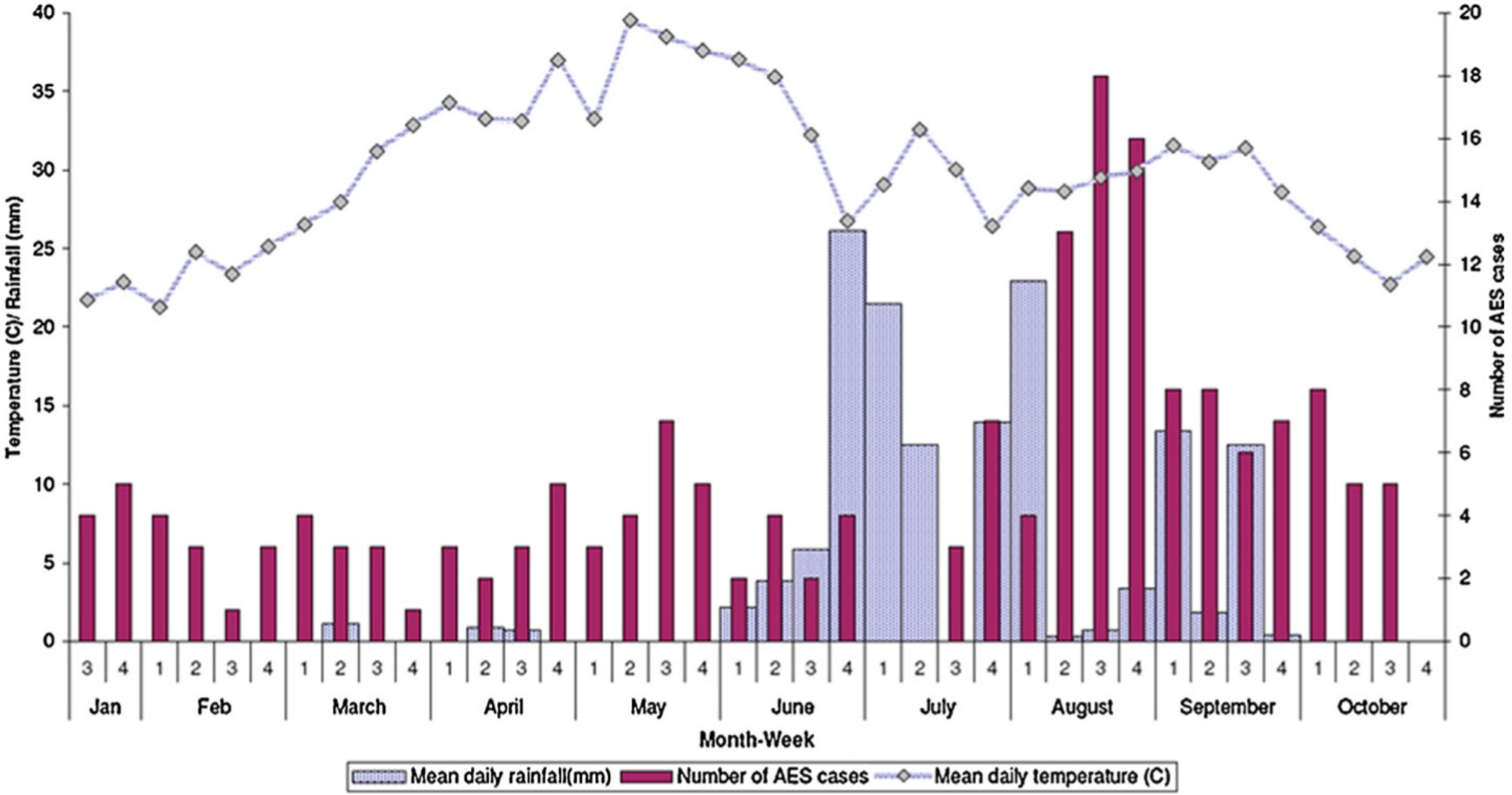
Abhijit Pakhare[1], Yogesh Sabde[2], Ankur Joshi[3], Rashmi Jain[4], Arun Kokane[1] & Rajnish Joshi[5]



JVBD 2016

Clinical presentation, etiology, and survival in adult acute encephalitis syndrome in rural Central India

Rajnish Joshi [a,*], Pradyumna Kumar Mishra [b], Deepti Joshi [c], Santhosh SR [d], M.M. Parida [e], Prabha Desikan [f], Nitin Gangane [g,h], S.P. Kalantri [g,h], Arthur Reingold [i], John M. Colford Jr. [i]

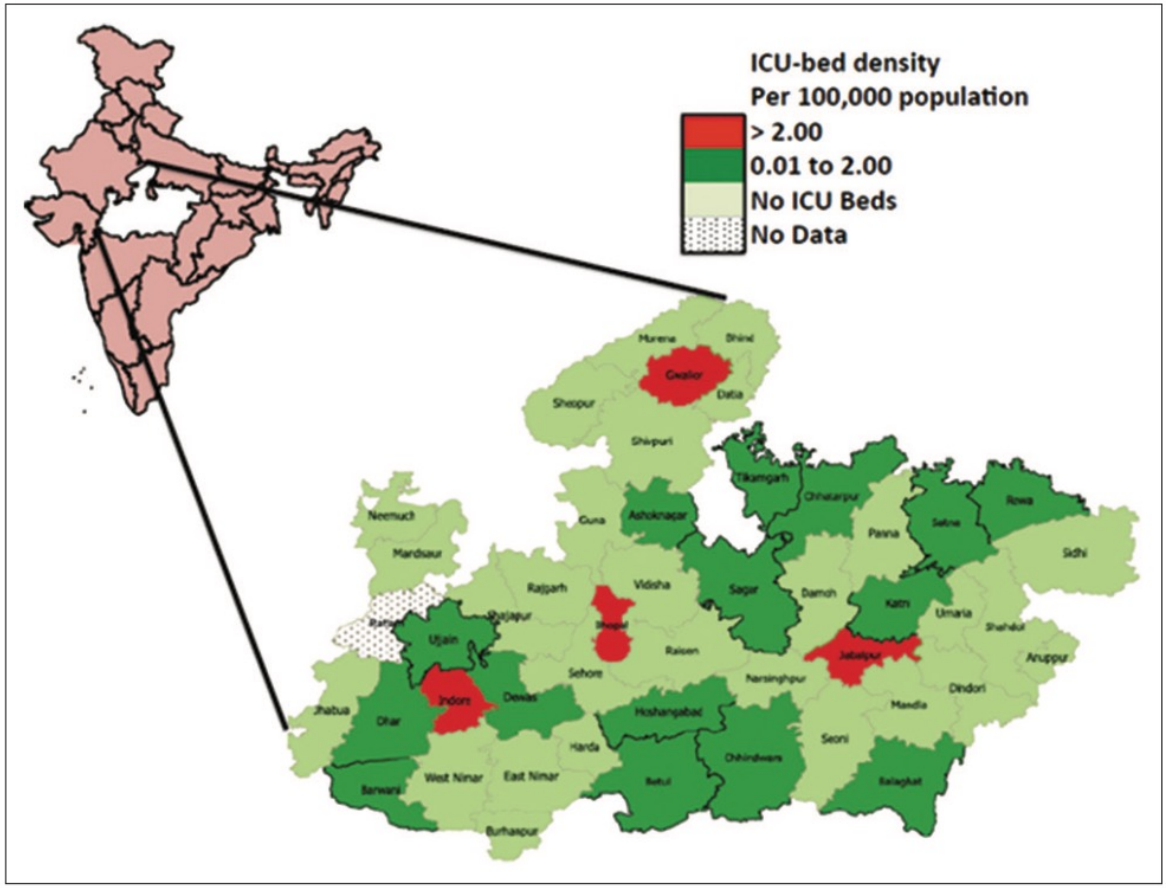


J Clin Neurol Neurosurg 2013

Mapping the Characteristics of Critical Care Facilities: Assessment, Distribution, and Level of Critical Care Facilities from Central India

Saurabh Saigal, Jai Prakash Sharma[1], Abhijit Pakhare[2], Santosh Bhaskar[3], Sanjay Dhanuka[4], Sanjay Kumar[5], Yogesh Sabde[6], Pradip Bhattacharya[7], Rajnish Joshi[8]

Department of Trauma and Emergency Medicine, AIIMS, Departments of [1]Anaesthesia and [2]CFM, AIIMS, [3]Department of Anaesthesia, CMCH, Bhopal, [4]Department of CCM, Greater Kailash Hospital, Indore, Madhya Pradesh, [5]Department of Anaesthesia, ANNIMS, Port Blair, Andaman and Nicobar Islands, [6]Scientist E, NIREH, [7]Department of Emergency Medicine and CCM, CMCH, [8]Deparment of Medicine, AIIMS, Bhopal, Madhya Pradesh, India

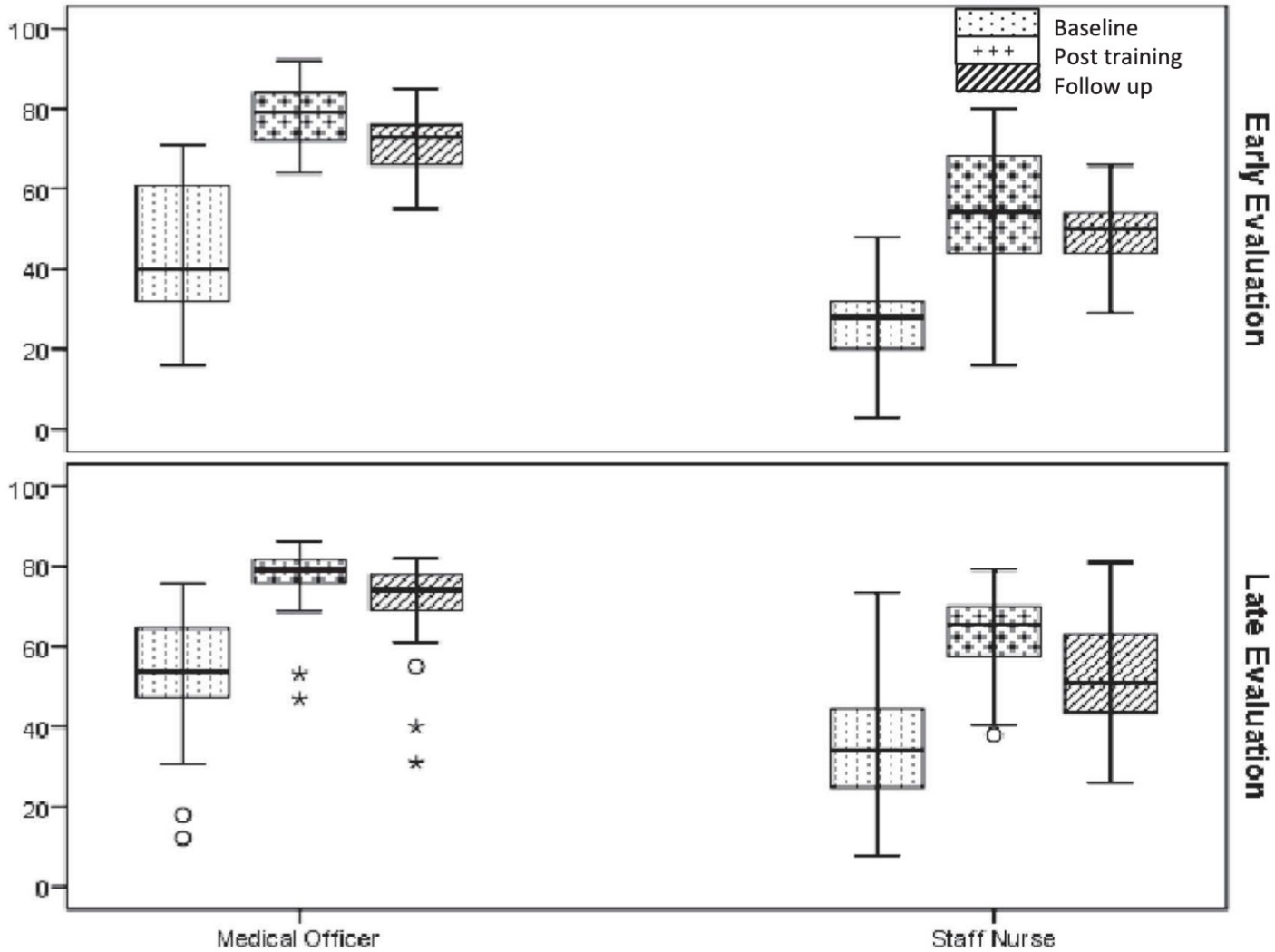


Indian Journal of Critical Care Medicine; 2017

Improving the capacity of nurses for non-communicable disease service delivery in India: how do they fare in comparison to doctors?

Rajnish Joshi[a], Abhijit Pakhare[b], Sanjeev Kumar[b], Sagar Khadanga[a] and Ankur Joshi[b]

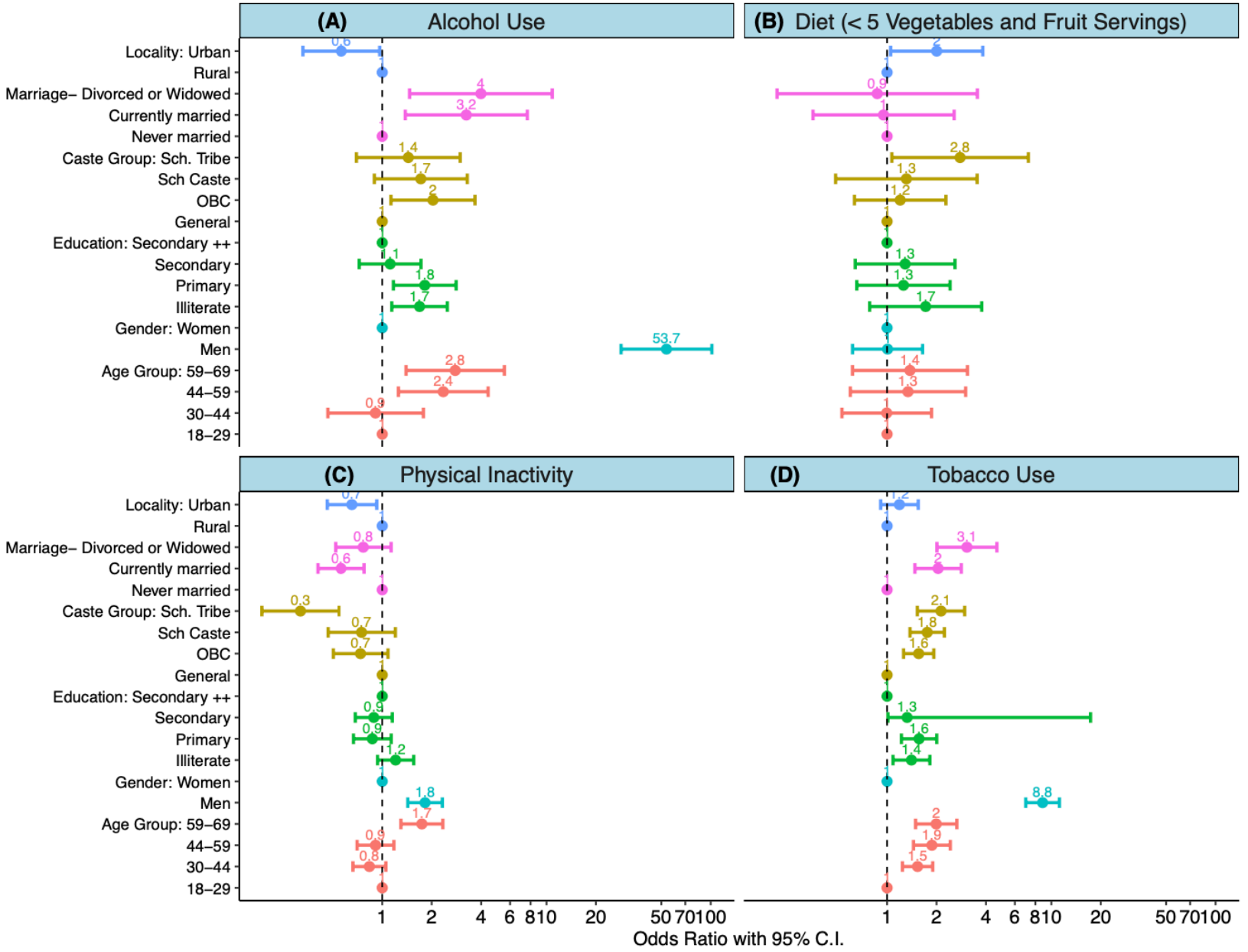
[a]Department of Medicine, All India Institute of Medical Sciences, Bhopal, India; [b]Department of Community and Family Medicine, All India Institute of Medical Sciences, Bhopal, India



Education for Primary Care; 2019

Determinants of behavioural and biological risk factors for cardiovascula diseases from state level STEPS survey (2017–19) in Madhya Pradesh

Arun M. Kokane[1], Rajnish Joshi[2], Ashwin Kotnis[3], Anirban Chatterjee[1], Kriti Yadav[1], G Revadi[1], Ankur Joshi[1], Abhijit P. Pakhare[1]



Peer J; 2020

Article

Patterns of Glycemic Variability During a Diabetes Self-Management Educational Program

Ankur Joshi [1], Arun Mitra [1], Nikhat Anjum [2], Neelesh Shrivastava [3], Sagar Khadanga [3], Abhijit Pakhare [1] and Rajnish Joshi [3,*]

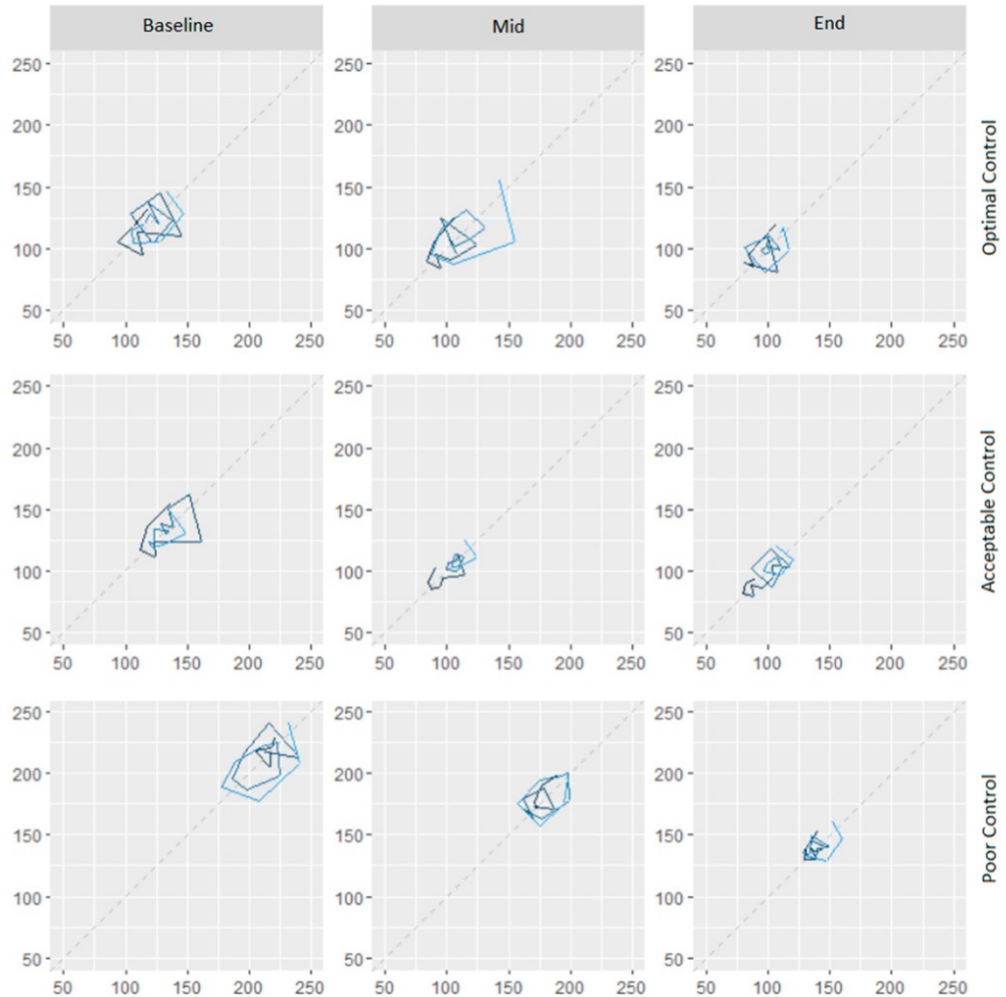


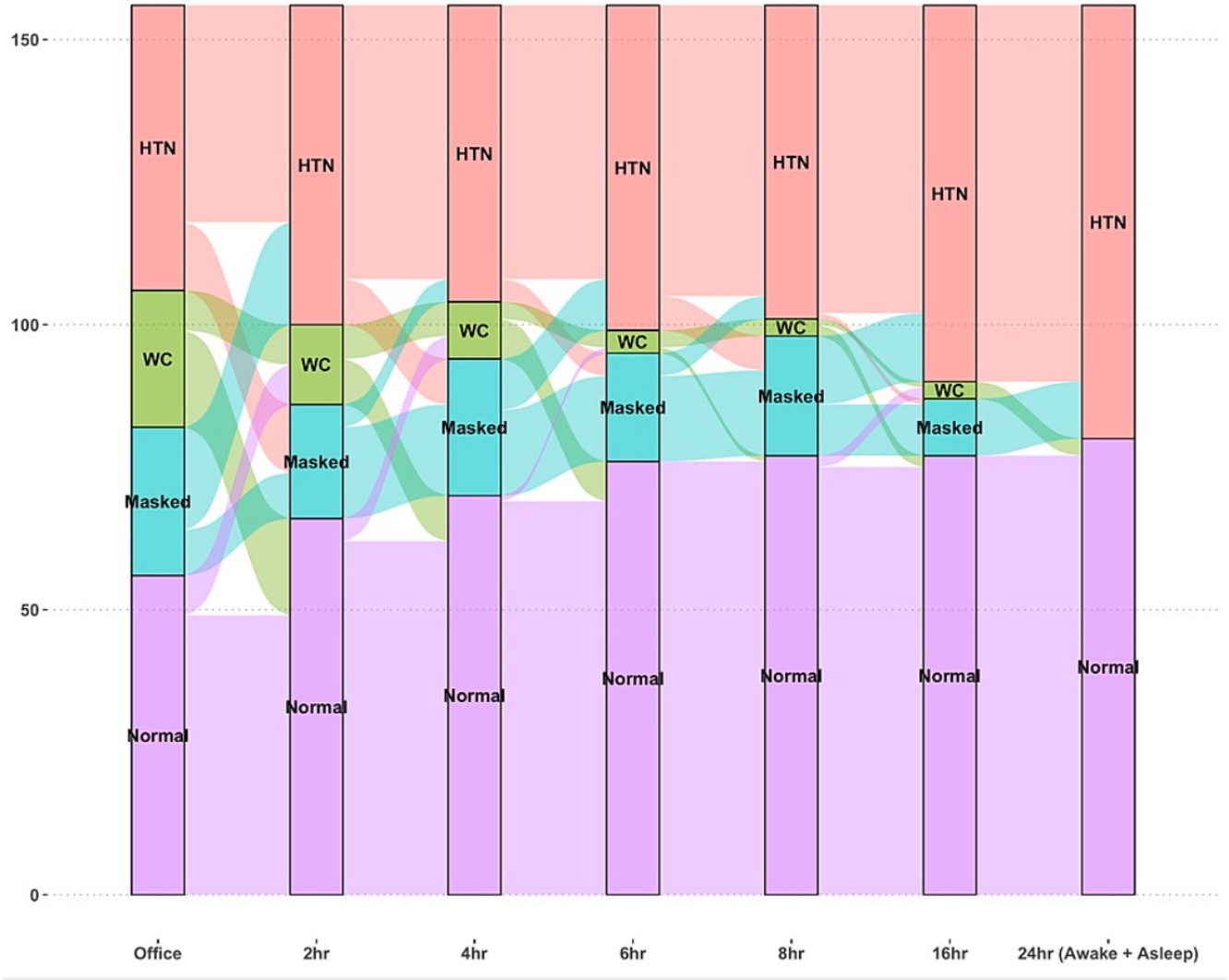
Figure 2. Composite assessment of glycemic control and variability based on raw glucose values at the same time on two sequential days (lag plot).

BMJ Open

Domain and Potential Barriers to effective risk reduction	Group A Public Linked n=75	Group B Private n=22	Group C Interrupters n=19	Group D Not Linked n=51	All n=167
Knowledge					
Not aware that tobacco intake leads to HTN	82.7	86.4	84.2	76.5	81.4
Not aware that Obesity leads to HTN or DM	62.7	68.2	42.1	47.1	56.3
Not aware that HTN /DM can lead to heart attack/stroke	42.7	59.1	68.4	39.2	46.7
Not aware that Tobacco use can be reduced	38.7	36.4	42.1	33.3	37.1
Not aware that Obesity can be reduced	25.3	40.9	15.8	23.5	25.7
Not aware that HTN /DM can be controlled with drugs	8.0	4.5	0.0	5.9	6.0
Attitude					
Denial of presence of risk factors	9.3	13.6	10.5	29.4	16.2
Acknowledges risk but does not want to reduce	5.3	9.1	5.3	27.5	12.6
Feels that risk reduction measures don't work	5.3	9.1	0.0	19.6	9.6
Wants to reduce risk but not by a lifelong pill	13.3	9.1	21.1	35.3	20.4
Wants to reduce risk but cannot devote time to physical	16.0	36.4	10.5	27.5	21.6
Wants to reduce risk but cannot change dietary lifestyle	4.0	9.1	5.3	17.6	9.0
Health provider					
My 'doctor' says that I don't need any risk reduction	45.3	31.8	26.3	41.2	40.1
My 'doctor' says that I don't need any pills or medicines	18.7	9.1	42.1	51.0	29.9
I have been prescribed alternate therapy	5.3	13.6	10.5	3.9	6.6
Individual					
I sometimes forget to take drugs	45.3	45.5	31.6	23.5	37.1
I sometimes forget to get a prescription refill	24.0	36.4	21.1	23.5	25.1
I donot have the motivation to engage in risk reduction	18.7	13.6	26.3	29.4	22.2
I had an adverse drug response due to medicines	16.0	18.2	5.3	5.9	12.0
Health system					
Govt health center is far away	32.0	50.0	15.8	15.7	27.5
Govt health center is crowded	45.3	50.0	26.3	21.6	36.5
Drugs are not available at the health center	14.7	18.2	5.3	3.9	10.8
Drugs are dispensed for short period, multiple visits	48.0	45.5	31.6	13.7	35.3
Drugs from govt health center are substandard	22.7	9.1	0.0	11.8	15.0
Private drug stores are far away	16.0	18.2	10.5	13.7	15.0
Private drugs are expensive	30.7	50.0	36.8	13.7	28.7
Social support					
Family member does not want me to reduce risk	21.3	18.2	21.1	33.3	24.6
Family members not willing to get medicines for me	26.7	18.2	47.4	54.9	36.5
Peers believe that risk reduction does not work	5.3	4.5	0.0	2.0	3.6

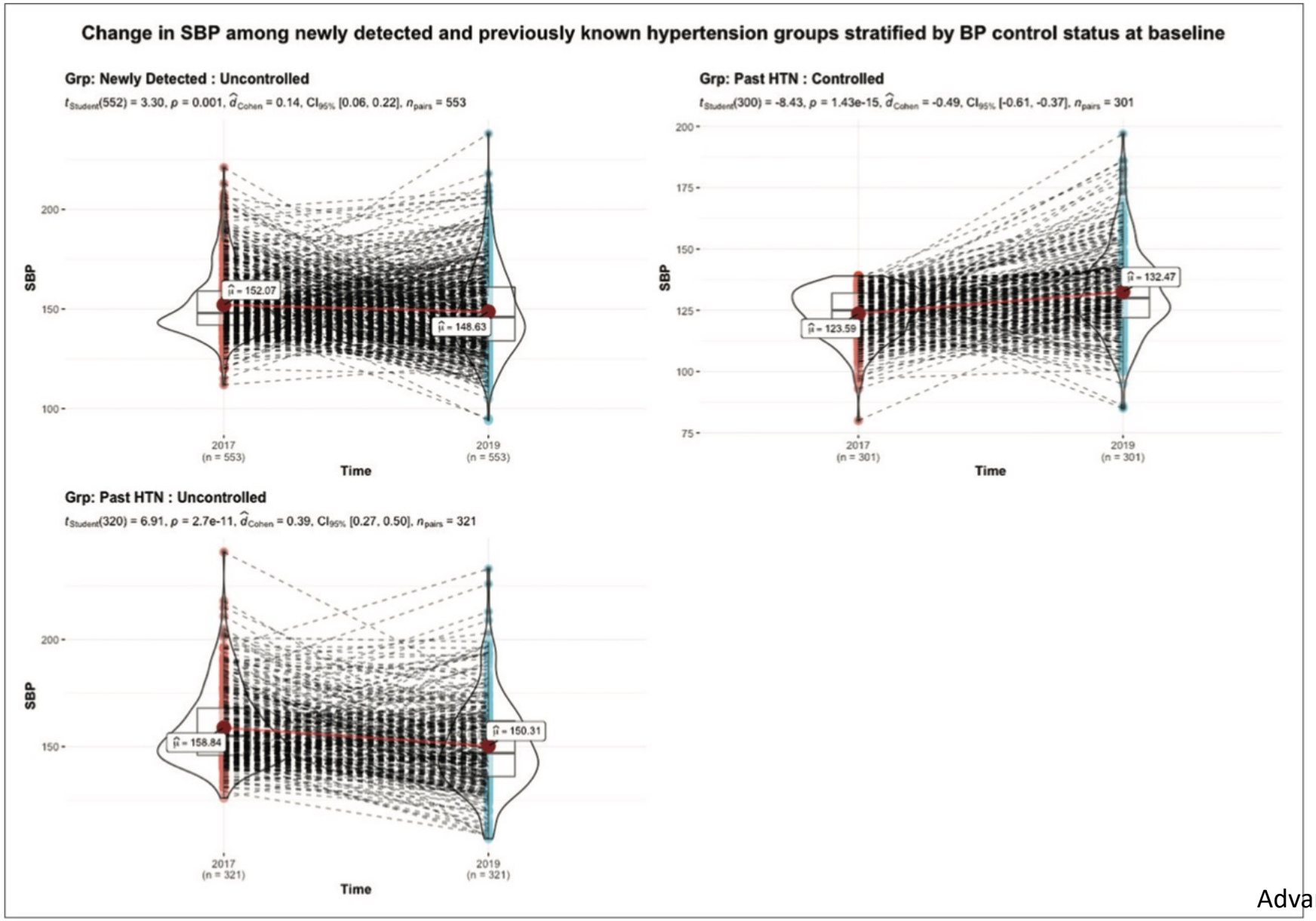
Accuracy of Short-Term Ambulatory Blood Pressure Measurements for the Diagnosis of Hypertension

Sooraj Unnikrishnan [1] , Onkar Awadhiya [1] , Anuja Lahiri [2] , Abhijit P. Pakhare [2] , Ankur Joshi [2] , Rajnish Joshi [1]



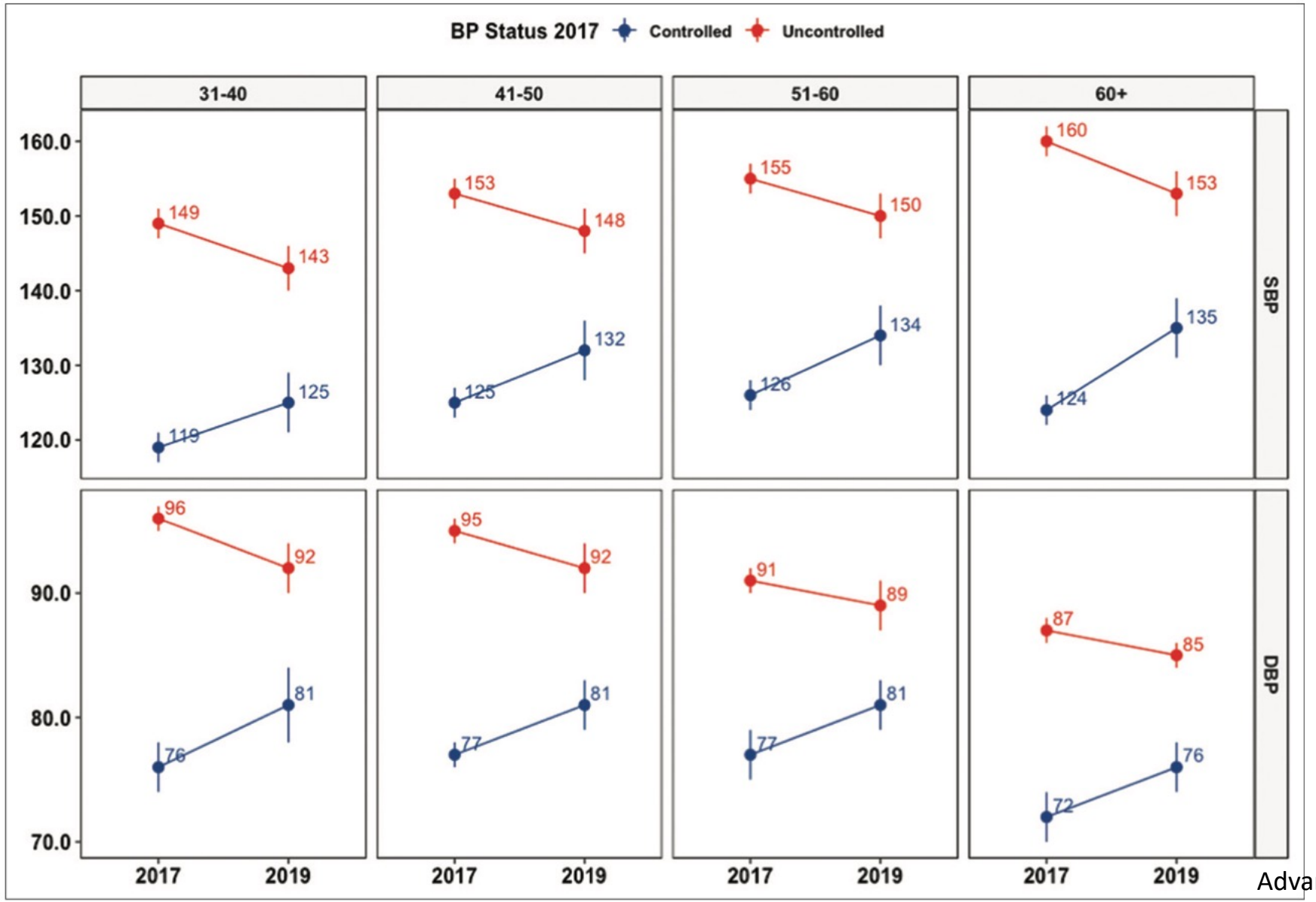
Cureus 2021

Status of Hypertension Control in Urban Slums of Central India: A community Health Worker-Based Two-Year Follow-Up



Advanced Biomedical Research 2023

Status of Hypertension Control in Urban Slums of Central India: A community Health Worker-Based Two-Year Follow-Up



Advanced Biomedical Research 2023

Ten Principles of data visualization

1. Avoid clutter
2. Balance colors
3. Use annotations
4. Avoid 3D figures
5. Use consistent fonts
6. Know your audience
7. Start columns with Zero
8. Make labels easy to read
9. Break up complex charts into simple
10. Consider overall message and engagement