

Dental Fluorosis in Nagaur district, Rajasthan

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Map of Nagaur district,
Rajasthan.



INTRODUCTION

- India has two acute public-health problems induced by utilization of groundwater as a source of drinking water having excess fluoride and arsenic..
- Fluoride is one of the important life elements. It is essential for normal mineralization of bones and formation of dental enamel. When fluoride is taken more than the permissible limit, it becomes toxic and would cause various metabolic disturbances in animals and human being including dental and skeletal fluorosis.
- In Nagaur District (population: approximately 3.31 million) of State of Rajasthan, the main source of water supply is groundwater which invariably does not confirm to WHO standards as it contains excess of fluoride. Despite its unsuitability, residents are force to use the groundwater for drinking due to a lack of other water resources, resulting in problems such as dental and skeletal fluorosis among them.
- About 80 percent of the population in the district does not have access to safe water, placing the district as having one of the most dire water shortages in the state.

- About 62 million people are at risk of developing fluorosis from drinking water with high fluoride concentration.
- In Nagaur District (population: approximately 3.31 million) of State of Rajasthan, the main source of water supply is groundwater which invariably does not conform to WHO standards as it contains excess of fluoride. Despite its unsuitability, residents are forced to use the groundwater for drinking due to a lack of other water resources, resulting in problems such as dental and skeletal fluorosis among them.
- A survey in 2016 found that approximately 34 percent of children in the district between the ages of six and fourteen had fluorosis. About 80 percent of the population in the district does not have access to safe water, placing the district as having one of the most dire water shortages in the state.

RESEARCH QUESTION

- What is the status of Dental Fluorosis in various age groups in six blocks of Nagaur district, Rajasthan?

OBJECTIVE

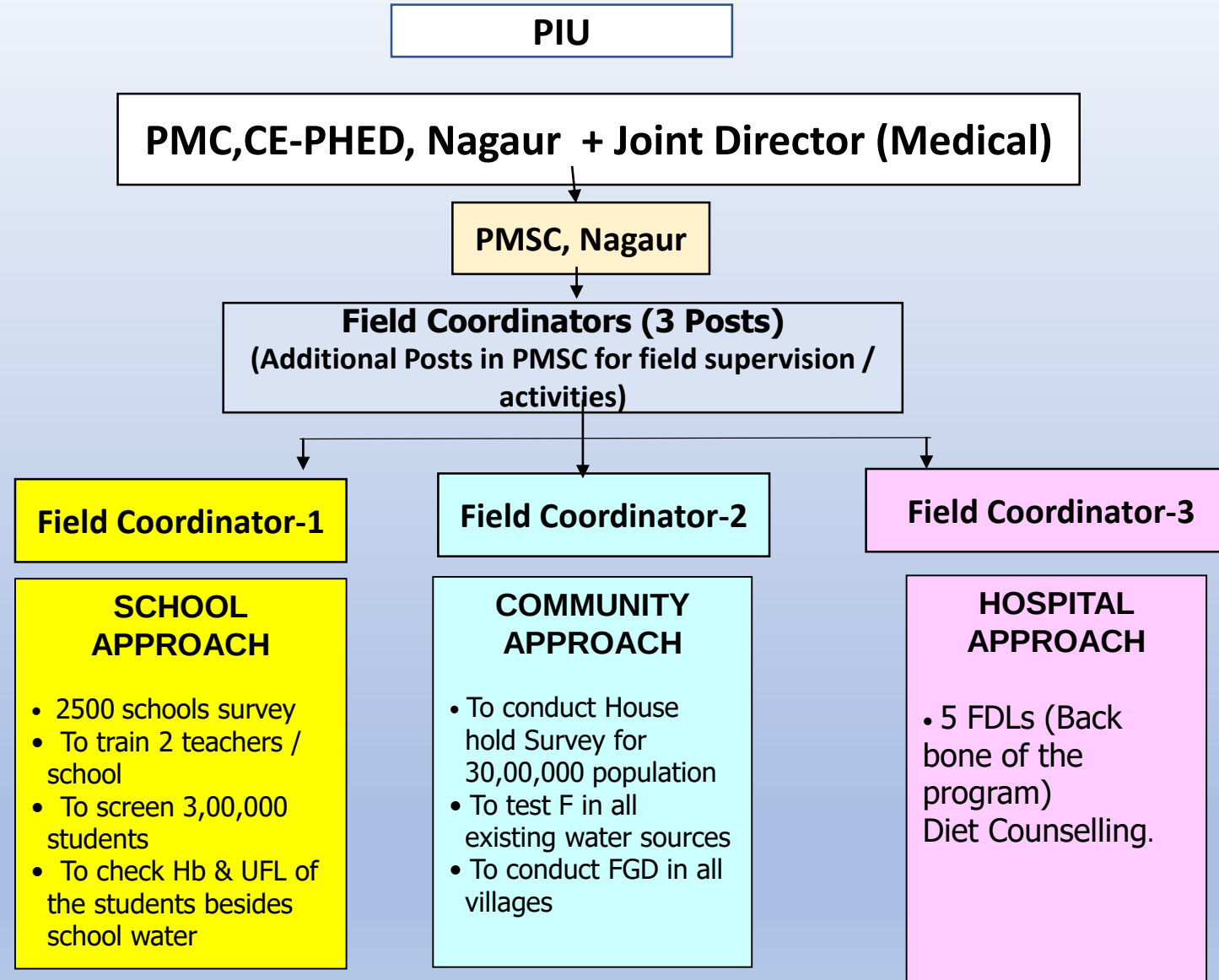
- To study status of Dental Fluorosis in various age groups in six blocks of Nagaur district, Rajasthan.

To Mitigate Fluorosis

METHODOLOGY

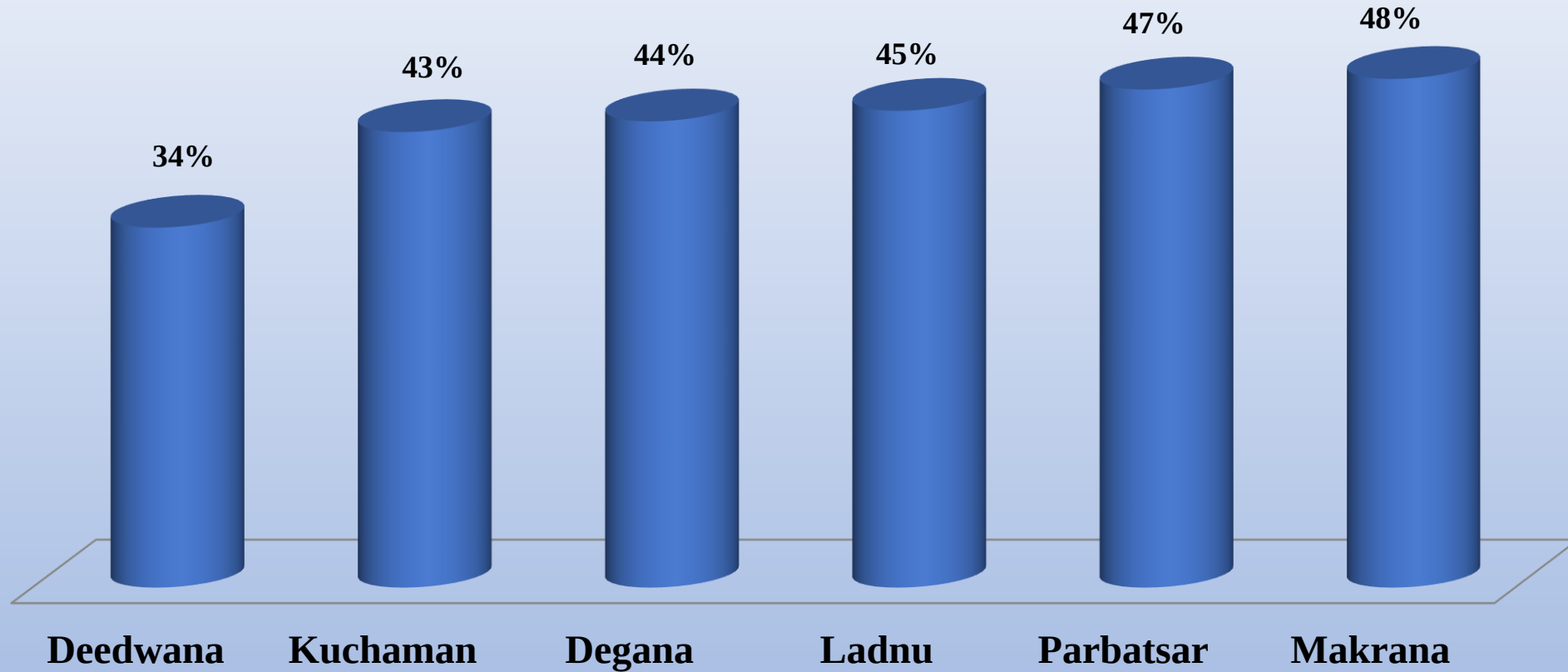
- **Study Location** : Nagaur district, Rajasthan.
- **Study Duration** : Feb 5th – 7th May 2019.
- **Study Design** : Descriptive cross sectional study.
- **Study Tool** : Secondary Data collected from PHED was assessed.
- **Sample Size** : 2400. Males and females (50 each) of various age groups from each block of Nagaur district.
- **Sampling** : Simple random sampling.

Flow chart for FMP implementation: Strategy



SCHOOL APPROACH

Comparison of DF in various blocks (6 yrs- 20 yrs)

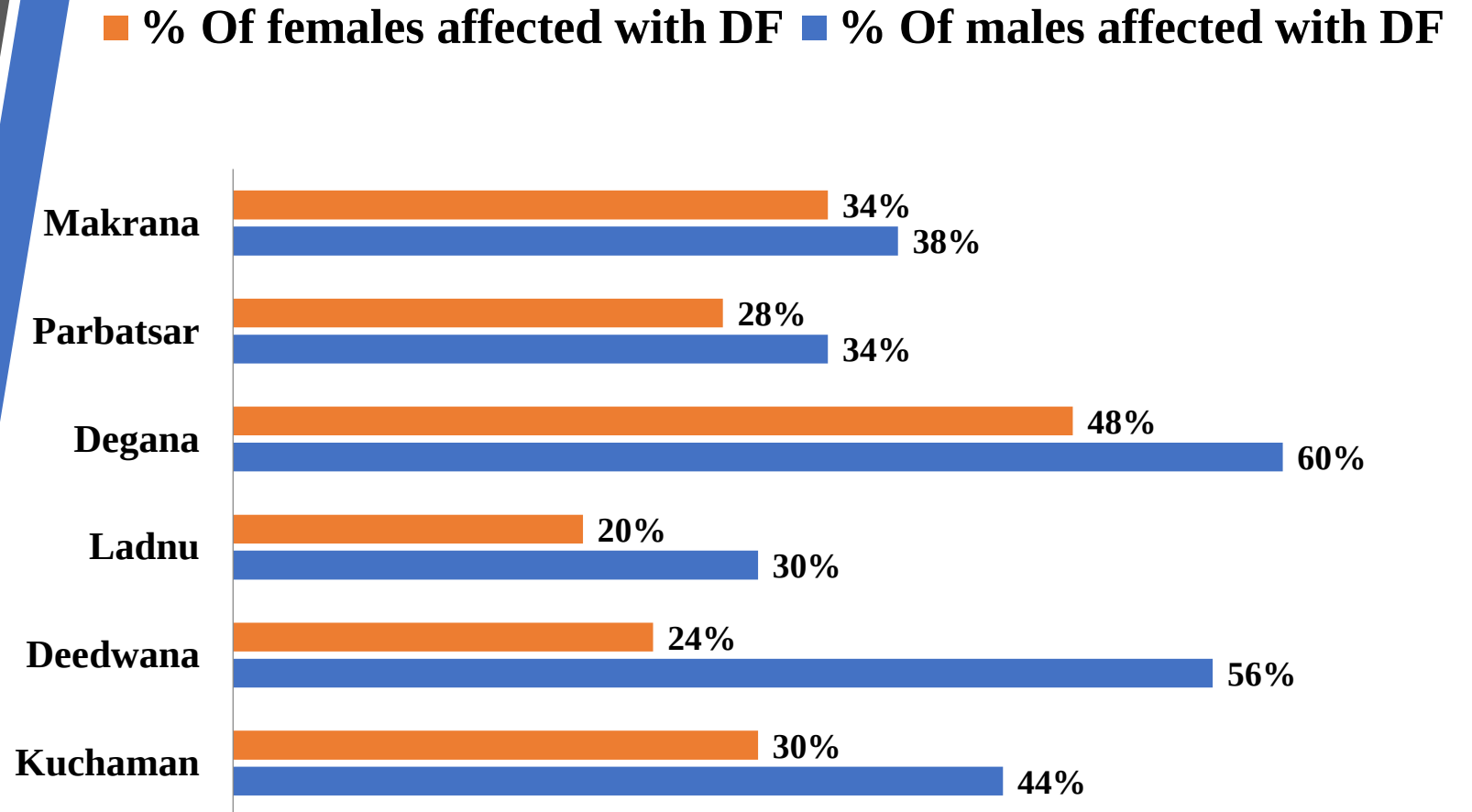


It is observed that Makrana has highest Dental fluorosis affected patients followed by Parbatsar, Ladnu, Degana, Kuchaman whereas Deedwana has lowest dental fluorosis affected patients.

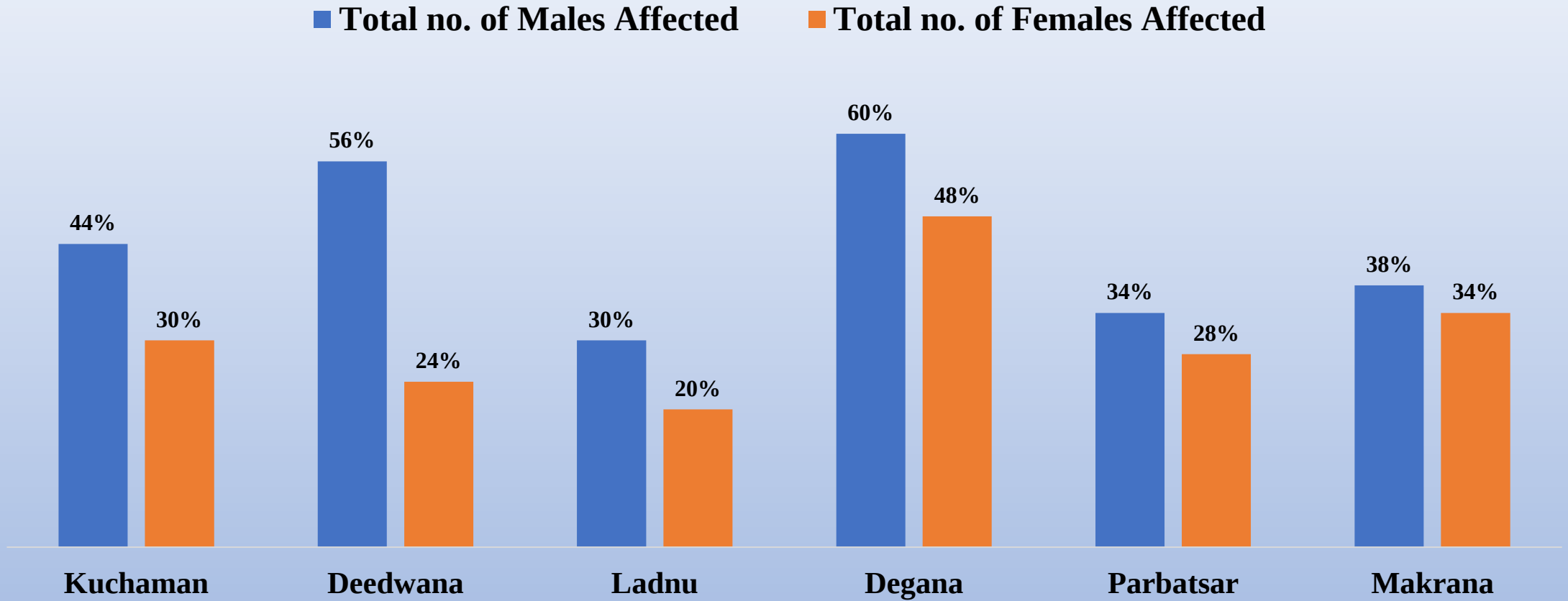
Interpretation:

Degana has highest measure of Dental fluorosis followed by Deedwana, Kuchaman, Makrana, Parbatsar, Ladnu. It is also observed that dental fluorosis is more prevalent in males than females in the age group of 6- 20 years of age. (n=600)

DF In Age Group (6yrs-20yrs)



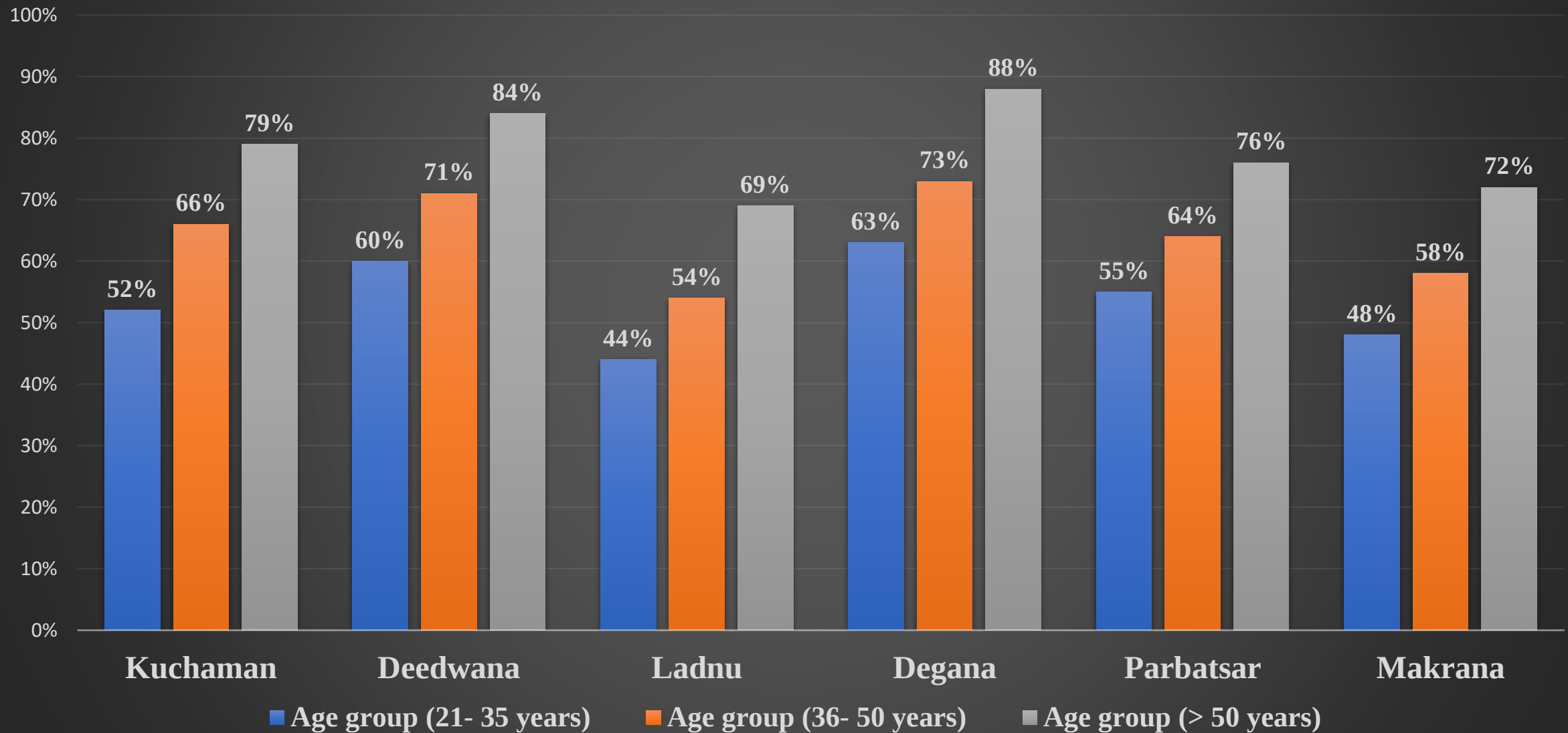
School Approach: DF in age group(6- 20 years) in 6 districts.



It is observed that Degana (60%) has highest number of Males affected followed by Deedwana (56%), Kuchaman (44%), Makrana (38%), Parbatsar (34%), Ladnu (30%). Degana (48%) has also highest number of Females affected followed by Makrana (34%), Kuchaman (30%), Parbatsar (28%), Deedwana (24%), Ladnu (20%).

COMMUNITY APPROACH

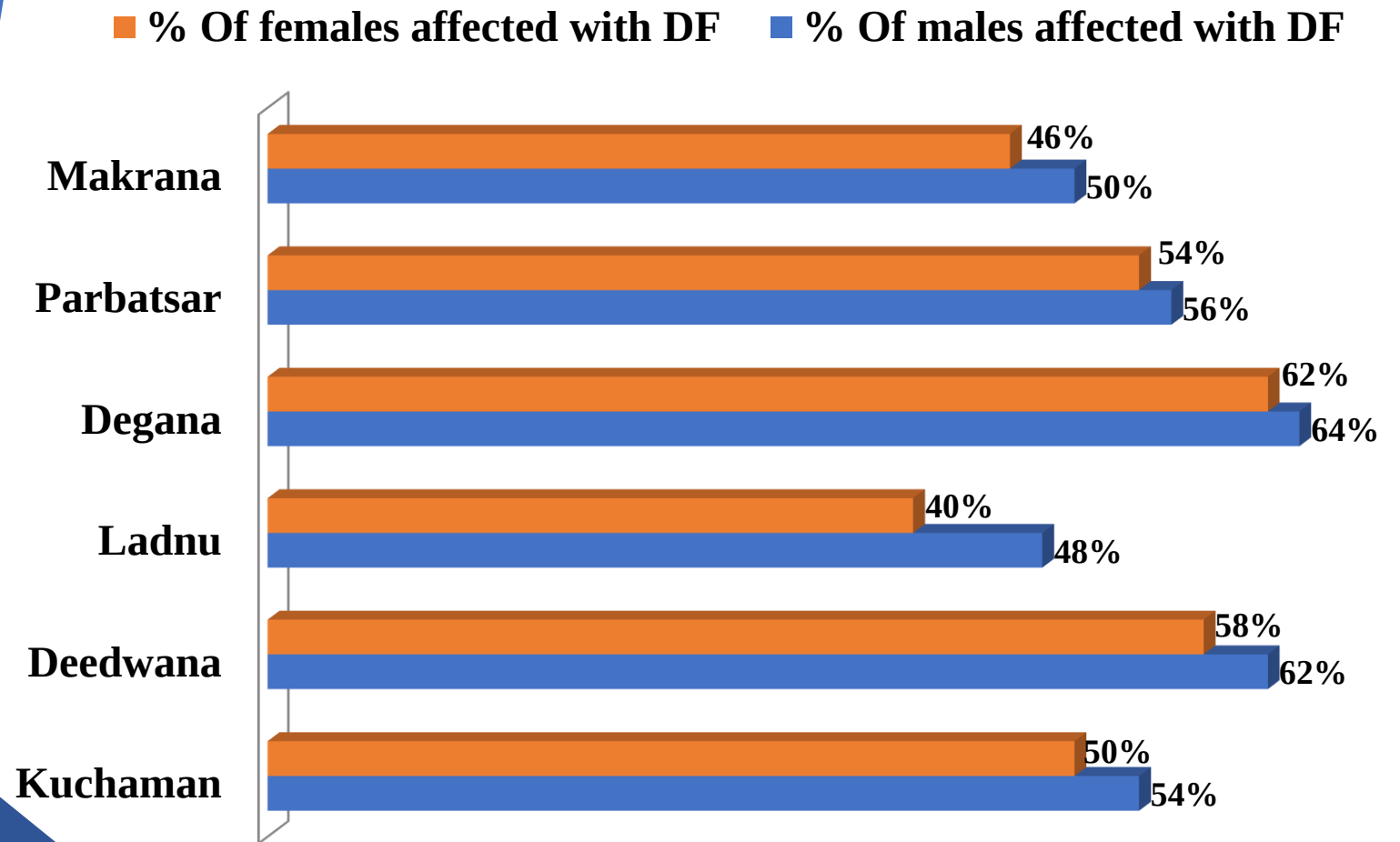
Community Approach: DF In different Age groups in 6 districts.



Interpretation:

Degana has highest measure of Dental fluorosis followed by Deedwana, Kuchaman, Makrana, Parbatsar, Ladnu in age group of 21- 35 years. It is also observed that Dental fluorosis is more prevalent in males than females. (n=600)

DF In Age Group (21yrs- 35yrs)

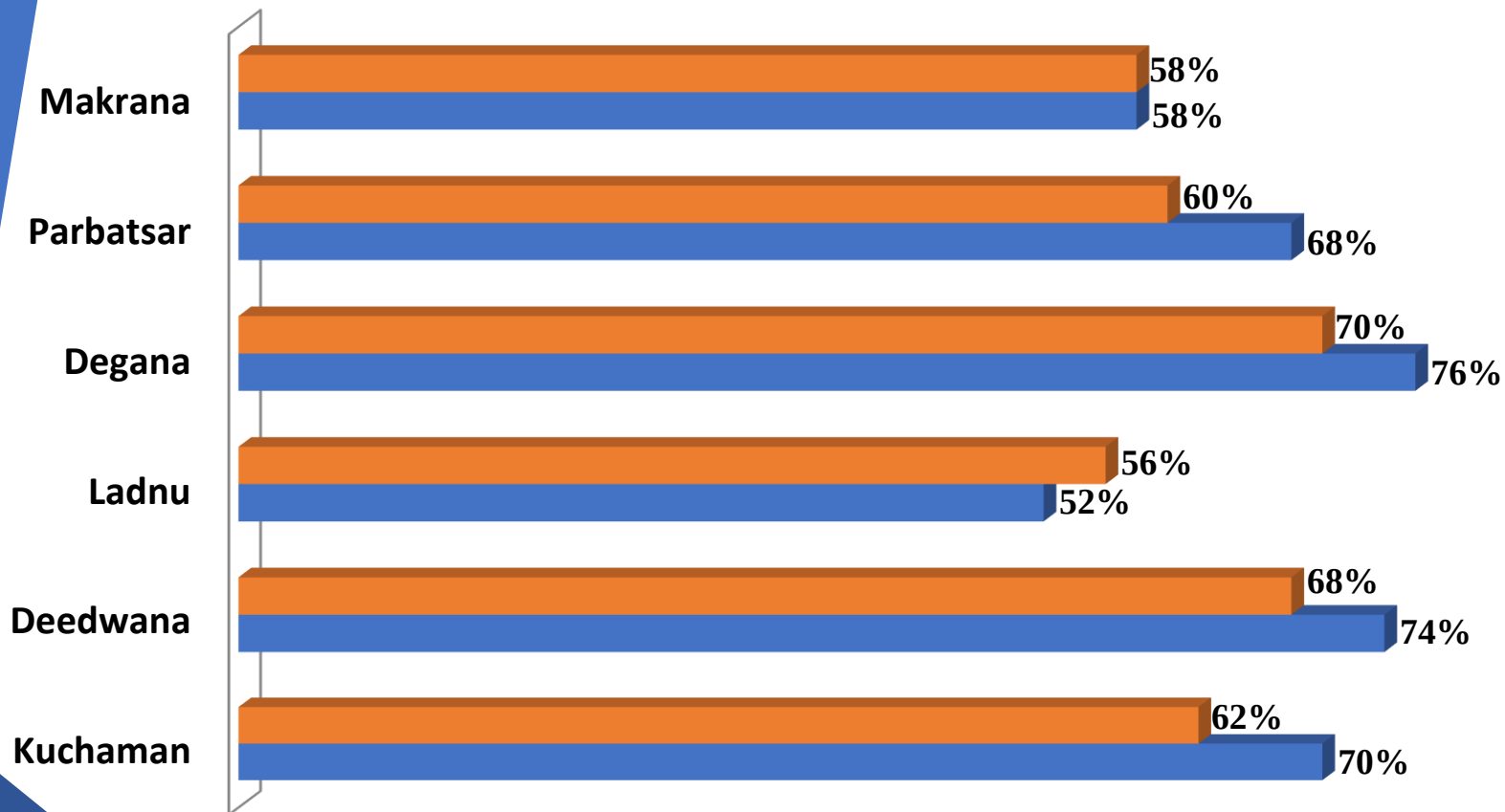


Interpretation:

After age 36, there is no significant difference in males and females in Makrana. This difference is may be due to migrating females from other villages after marriage. (n=600).

DF In Age Group (36yrs- 50yrs)

■ % Of females affected with DF ■ % Of males affected with DF

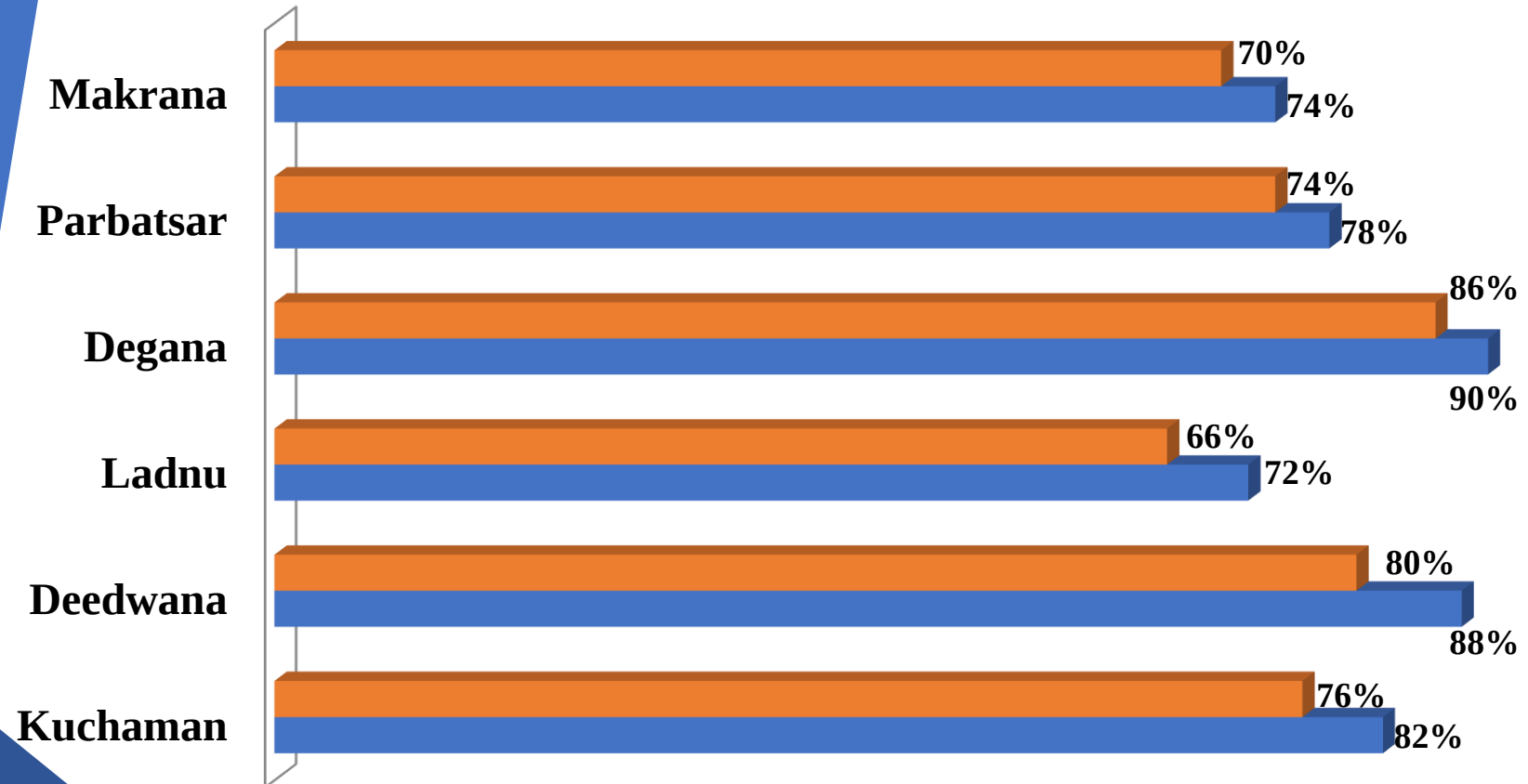


Interpretation:

Degana has highest amount of Dental fluorosis followed by Deedwana, Kuchaman, Makrana, Parbatsar, Ladnu. It is also observed that males are more prevalent than females. (n=600). It can be observed that rate of DF increased with increasing age.

DF In Age Group (50 & Above)

■ % Of females affected with DF ■ % Of males affected with DF



DISCUSSION

- The amount of dental fluorosis can vary widely from region to region following the concentration of fluoride in drinking water. However, besides water fluoride concentration and duration of exposure, other factors such as dissolved salts in drinking water and nutritional habits would also affect the prevalence of dental fluorosis.
- The only remedy is prevention by keeping fluoride intake within the safe limits. Fluoride poisoning can be prevented or minimized by using alternative water sources, removing excess fluoride, and improving the nutritional status of the population at risk.
- Clinical data indicates that adequate calcium intake is clearly associated with a reduced risk of dental fluorosis.
- Vitamin C may also act as a safeguard against the risk.
- In studied villages, fluorosis is caused mainly by excess intake of fluoride in drinking water. We observed a significant dose-response relationships between water fluoride level and prevalence of dental fluorosis.

CONCLUSION

- Degana has highest number of Dental fluorosis affected patients in community approach whereas Makrana has highest number of dental fluorosis patients in school approach.
- It can be observed that rate of Dental Fluorosis increased with increasing age.
- After age 36, there is no significant difference in males and females in Makrana. This difference is may be due to migrating females from other villages after marriage.
- High level of fluoride in drinking water of various blocks of Nagaur district, Central Rajasthan, India, causes dental fluorosis in most people in the region and is an important health problem that needs prompt attention.

School Approach	Community Approach
Makrana has highest Dental fluorosis affected patients (48%) followed by Parbatsar (47%), Ladnu (45%), Degana (44%), Kuchaman (43%) whereas Deedwana (34%) has lowest dental fluorosis affected patients	- Age group (21- 35 years): Degana (63%) has highest measure of Dental fluorosis followed by Deedwana (60%), Parbatsar (55%), Kuchama (52%), Makrana (48%), Ladnu (44%). - Age group (36- 50 years): Degana (73%) has highest measure of Dental fluorosis followed by Deedwana (71%), Kuchaman (66%), Parbatsar (64%), Makrana (58%), Ladnu (54%). - Age group (>50 years): Degana (88%) has highest measure of Dental fluorosis followed by Deedwana (84%), Kuchaman (79%), Parbatsar (76%), Makrana (72%), Ladnu (69%). - It can be observed that rate of DF increased with increasing age.
- Degana (60%) has highest number of Males affected followed by Deedwana (56%), Kuchaman (44%), Makrana (38%), Parbatsar (34%), Ladnu (30%). - Degana (48%) has highest number of Females affected followed by Makrana (34%), Kuchaman (30%), Parbatsar (28%), Deedwana (24%), Ladnu (20%).	- It is observed that Dental fluorosis is more prevalent in males than females. - After age 36, there is no significant difference in males and females in Makrana. This difference is may be due to migrating females from other villages after marriage.

Suggestions and Recommendations

- To conduct group counselling in the schools for the Parents, Teachers and Students by the Diet Counsellors – how to eliminate toxic fluoride from the body.
- Practicing interventions at certain specified intervals by re-checking Hb and re-testing of urine fluoride level of the students.
- To laminate veneering of severely DF affected students.
- Awareness generation program (for FMP) through social activities (viz. Nukkad Natak, Puppet show etc.) by the NGOs engaged in CDS packages under RRWS & FMP besides their regular activities in the community.
- To develop, print & disseminate Information, Education & Communication (IEC) materials viz. Pamphlets, Booklets, Posters, Wall Hangings etc. for hospitals / patients besides printing of adequate copies of pre-Coded performa for OPDs.
- To provide interventions (diet editing & diet counselling) to the Fluorosis affected patients through trained Diet Counsellors.
- To monitor Fluorosis affected patients till recovery.
- To test urine and water samples collected from schools / field and to share the data to the concern authority / Department.

REFERENCES

- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4525626/>
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3683180/>
- <https://www.indiawaterportal.org/sites/indiawaterportal.org/>
- <https://mdws.gov.in/press-release-rajasthan-fluorosis-mitigation-project-nagaur>
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Thank You

To Mitigate Fluorosis

Say
NO
to



SUPARI
&
TOBACCO



Say
Yes
to

