Original Article

Effect of Water Pollution on Human Health

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Abstract

Water is the most important &basic need in human life.Water consumption is increased due to increase in agricultural production and industrailization, that makes environmental pollution. which directly effects on water (i.e river water, dam water etc) Water bodies means lake, rivers, occeans, reservoirs and ground water. When these water sources is contaminated, which effects on human life, sustainable social development, (Xu.et al 2022)With the mobility of rural people to urban areas and wastewater of industrial production is increased. (Wu et al, 2020) The incidence of domestic agricultural and industerial pollution, which are responsible for environmental degradation. (R.K.Pareek & Srivastva 2018) Because improper sanitation and unhygienic condition can be favourable for bacterial infection in stomach, which can be responsible for death of two million people every year, and mostly less than five years of children are suffering from water pollution.(UNICEF) According to united Nation, nearly 90%deaths are due to unsafe drinking water. In India around 60% population is not offerdable to drink safe drinking water. Water pollution is controlled with the help of appropriate infrastructure and management system and legislation. Increased the sanitation rules regulation strictly as well as different therapies to controlled swage water.

The collected data is based on socioeconomic survey was undertaken. The collected data was coded and tabulated for further processing. The data was analyzed using SPSS version 20th software. To study the suitability of ground water for drinking purpose i.e. portability of water from three different sources i.e. Tap, borehole / hand pump and well water in rural areas of Aurangabad. To assess & compare the microbiological contamination of borehole / hand pump, well and tap water in rural and urban areas of Aurangabad district. All the samples have been analyzed in the laboratory of Lab and Manas Enterprises, Aurangabad.

Keywords: Diseases, Environment, Human Life, Pollution, Sustainability, Water

Introduction:

Water is one of the five element described in "Shastra" to life. It is essential resource for humen survival Now a days water consumption is increased due to increase in agricultural production and industerilization, that makes environmental and water pollution. Environmental pollution directly effects on water (i.e river water ,dam water etc) which also effects on human life, sustainable social development,(Xu.et al 2022)The incidence of domestic agricultural and industerial pollution ,which are responsible for environmental degradation.(R.K.Pareek & Srivastva 2018)Because improper sanitation and unhygienic condition can be favourable for bacterial infection in stomach, which can be responsible for death of two million people every year, and mostly less than five years of children are suffering from water pollution.(UNICEF) About 1.3 billion population living in rural areas with low income and does not offered safe drinking water. That means pollution affects on the life of present &future generation also(kumair2000, Kumar &et al2017)Mostly rural people vulnerable to disease due to improper sanitation hygiene and water supply. (Nel LH & Markotter w 2009) According to united Nation, nearly 90%deaths are due to unsafe drinking water. Because in India around 60% population is not accessible to drink safe drinking water.

The incidence of birth defects, cancers, diseases related to skin, lungs, brain kidneys and liver are several times more dominant than the contaminated water caused rashes, hair loss, and itchy skin &Lead level in blood stream of children who drank the water doubled than other communities.(Garg M2012) Moreover polluted water is an important cause of infant and child mortality in undeveloped countries.(Jorgenson 2009) Nitrate contamination in water may be responsible for goiter in children (Vladeva et.al 2009) Poor quality of water is associated with more sodium and salinity hazards.(Xiaoet al 2019)

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Water pollution causes different diseases such as cancer, dirrea, respiratory & neurological, cardiovascular diseases (Corcoran &et al 2010. Krishnan S, Indu 2006) Further quality of water is a major problem for humanity (Long2020) water Pesticides have an adverse impact on health through drinking water According to longitudinal Survey data, 10% increase in pesticide use resulted in a 1% increase in the medical disability index over 65 years of age(Lai 2017).More than50 kinds of diseases occurred due to poor drinking water. Improper disposal of solid waste, sand and gravel is also effect on water quality (ustaglua et al, 2020) Indian rural study revealed that children who are using with tap water have significantly lower prevalence of disease. (Jalan and Ravallion, 2003)

A study concluded that poor water quality due to growing incidence of domastic, agricultural, and industerial pollution which is causing environmental degradation also. (R.K.Pareek & Srivastva 2018).

Objectives:

- To assess the quality/pollution of water according to their parameter i.e. Chlorides, fluorides, calcium and total hardness.
- To study the safety and purity of ground water for drinking purpose i.e. portability of water from three different sources i.e. Tap, borehole / hand pump and well water in rural areas of Aurangabad.
- To assess & compare the microbiological contamination of borehole / hand pump, well and tap water in rural and urban areas of Aurangabad district.

Methodology:

### Flow Diagram of actual framework of the study
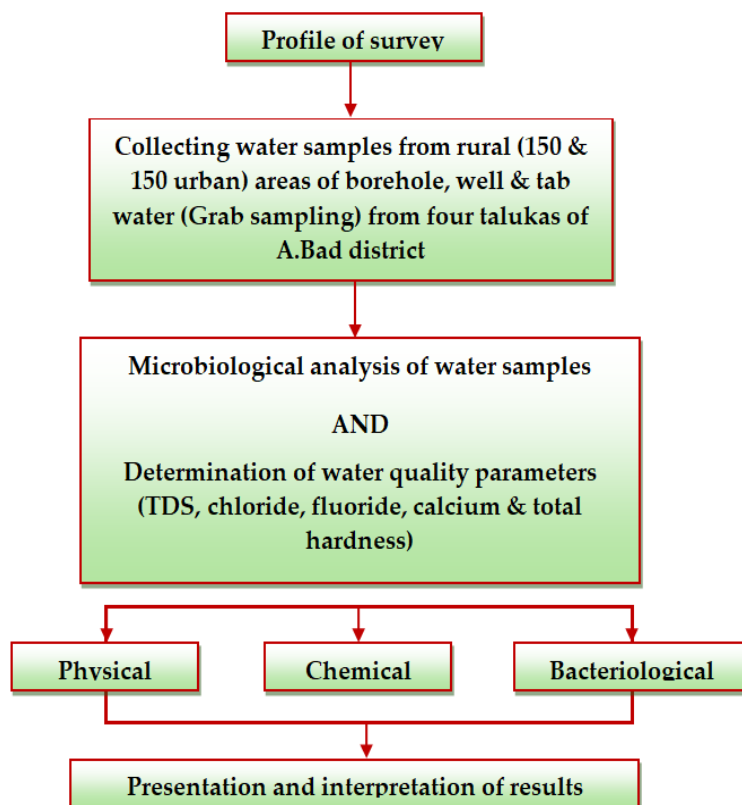
All the samples have been analyzed in the laboratory of Govt. of Maharashtra, water resource dept. Lab and Manas Enterprises, Soil and water testing laboratory, Aurangabad.

To collect the primary data a socioeconomic survey was undertaken. The collected data was coded and tabulated for further processing. The data was analyzed using SPSS version 20th software.

Result and Discussion:

Table No 1 Physicochemical analysis of water in rural areas of Aurangabad district:
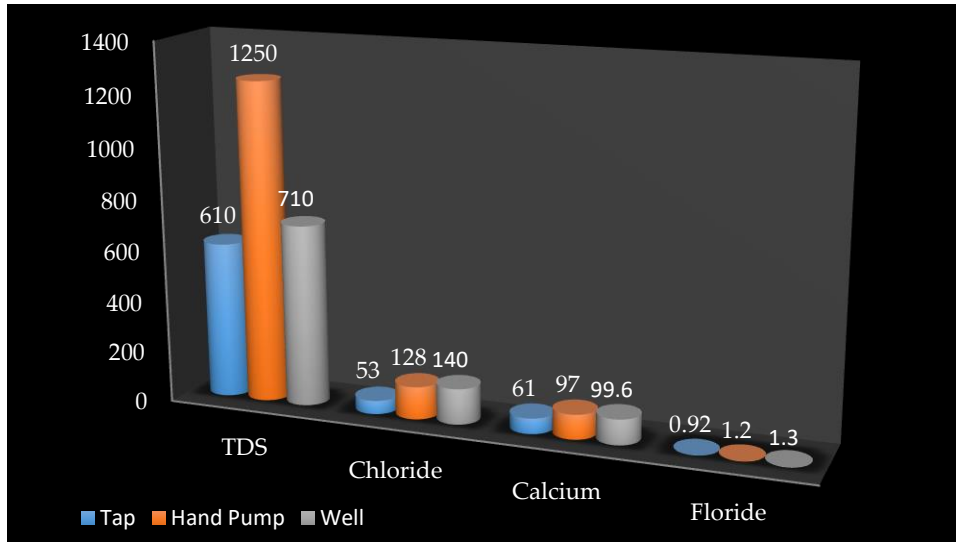
The above table represent that TDS from handpump ranged from 1250mgm/1 to maximum range of 1257 mg/1 in both areas (urban &rural)But in rural areas tap water contains 610 mg/1 amount of TDS more than the standard limit for drinking purpose. Chloride content was in permissible limit in urban & rural areas of A.bad district for drinking purpose. But in case of calcium content in rural areas of water was beyond the limit than the urban areas. Similarly fluoride concentration in rural areas from all sources was greater than the urban areas.

Table No. 2: Percentage distribution of microbiological analysis of water in rural area.

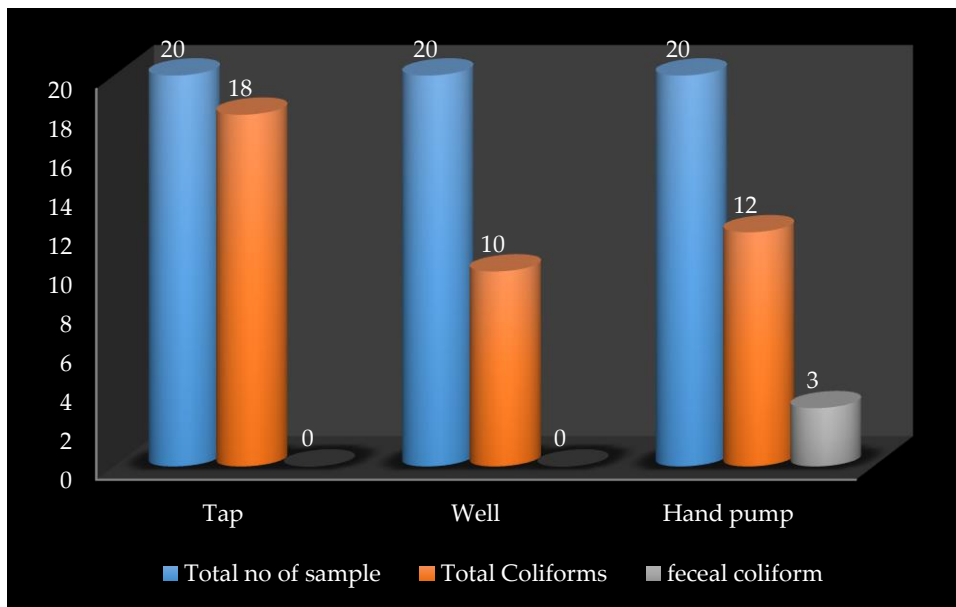| Source of water sample	Total No. of Samples	Total coli forms (MPN 100 ml)	Feceal coli forms (MPN 100 ml)	E.Coli. (MPN 100 ml)
Tap	20	18 (90%)	00	5 (25%)
Well	20	10 (50%)	00	10 (50%)
Borehole (Hand pump)	20	12 (60%)	5 (25%)	15 (75%)

Table No.3 Percentage distribution of microbiological analysis of water in urban area.

Source of water sample	Total No. of Samples	Total coli forms (MPN 100 ml)	Feceal coli forms (MPN 100 ml)	E.Coli. (MPN 100 ml)
Tap	20	--	00	00
Well	20	5 (25%)	--	2 (10%)
Borehole (Hand pump)	20	10 (50%)	--	5 (25%)

3 Percentage distribution of microbiological analysis of water in urban area.
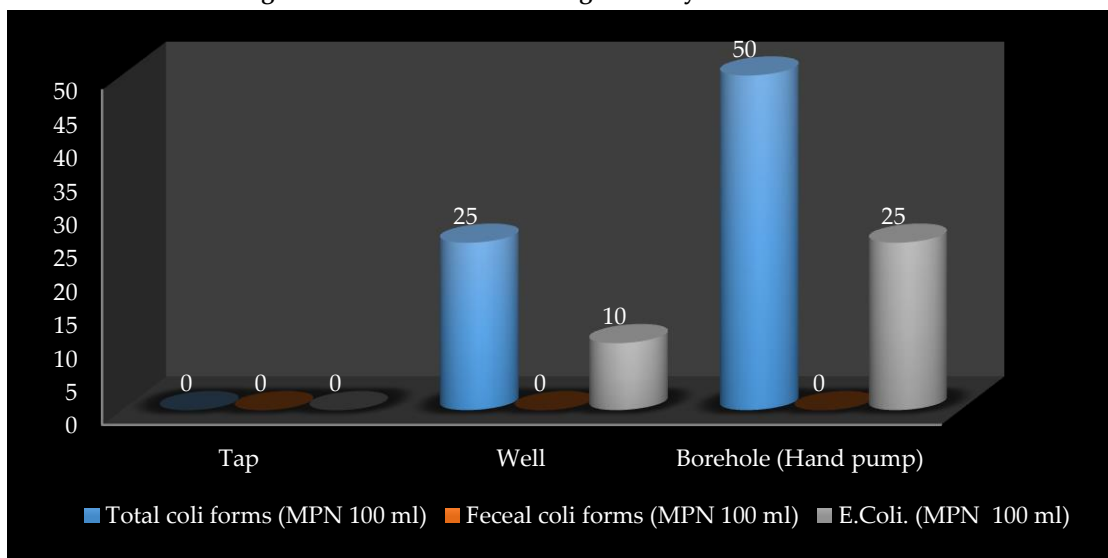
The above tables indicated that the presence of total coliforms in hand pump water samples of rural and urban areas was equal as similar to pathak study. In well water & tap water the presence of total coliform were found in the water sample of rural areas of Aurangabad district.

Table No.4 Means & S.D. Value of water quality parameter i.e. TDS

Water Quality parameters	Area of living	N	Mean	Std. Deviation	t-Test
TDS	Rural	150	25.74	6.68	3.68
	Urban	150	22.44	8.05	

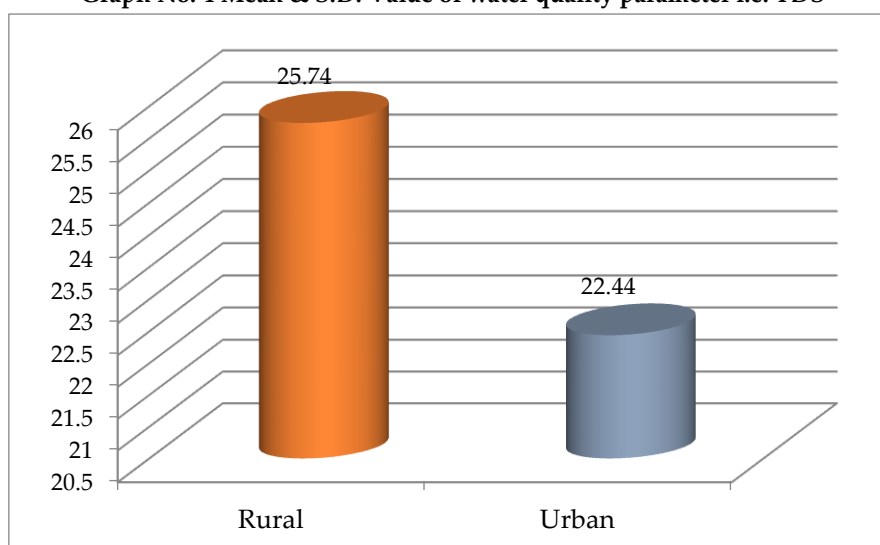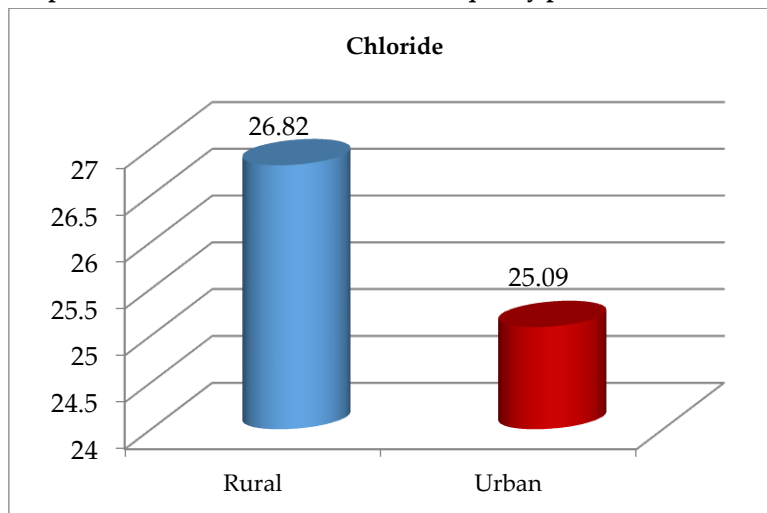**Graph No. 4 Mean & S.D. Value of water quality parameter i.e. TDS**

Table No.3 show that the mean score of TDS in rural areas found (25.74) & it is higher than the mean score of TDS 22.44 of the urban areas. It shows that there is significant difference between urban and rural areas in terms of water quality parameters i.e. TDS.

Table No. 5 Means & S.D. Value of water quality parameter i.e. chloride.

Water Quality parameters	Area of living	N	Mean	Std. Deviation	t-Test
Chloride	Rural	150	26.82	6.35	2.33
	Urban	150	25.09	6.47	

**Graph No. 5 Mean & S.D. Value of water quality parameter i.e. Chlorid**

The study results show that the mean score of rural areas is 26.82 and it is higher than the mean score of the urban i.e. 25.09. There is significant difference between urban and rural areas in terms of water quality parameter i.e. chloride.

Table No.6 Means & S.D. Value of water quality parameter i.e. fluoride.

Water Quality parameters	Area of living	N	Mean	Std. Deviation	t-Test
Fluoride	Rural	150	25.38	6.49	2.79
	Urban	150	23.28	6.25	

**Graph No. 6 Mean & S.D. Value of water quality parameter i.e. Fluoride**
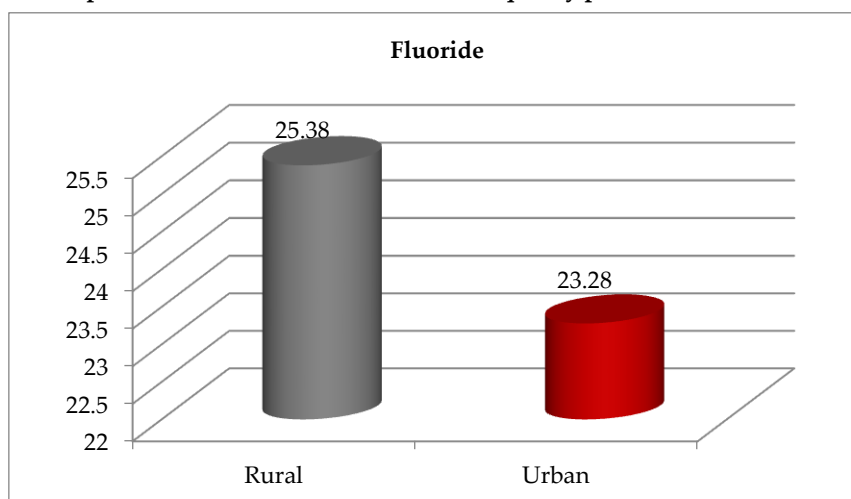
Study results indicated that the mean score i.e. 25.38 of rural areas is more than the mean score of urban areas 23.38. That means there is a significant difference between uban and rural areas in terms of water quality parameter i.e. Fluoride

Table No.7 Means & S.D. Value of water quality parameter i.e. Total Calcium

Water Quality parameters	Area of living	N	Mean	Std. Deviation	t-Test
Calcium	Rural	150	25.22	6.45	2.58
	Urban	150	23.16	7.25	

Graph No. 7 Mean & S.D. Value of water quality parameter i.e. Calcium
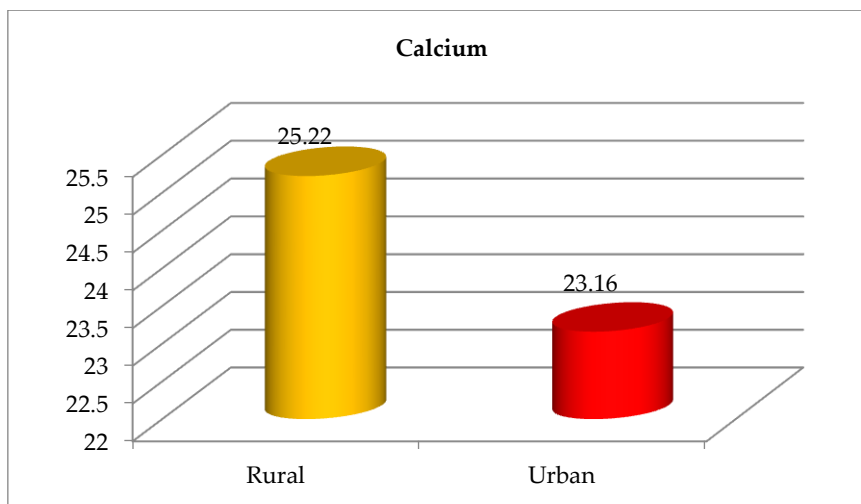
The mean score of calcium is (25.22) in rural area more than mean score of calcium (23.16) of urban area. It shows there is significant difference between mean value of calcium intake of rural and urban area on health of people in terms.

The above results show that the mean score of calcium is 25.22 & it is more than the mean score of urban areas i.e. 23.16. It shows that there is significant difference between value of calcium in rural & urban areas in terms of water quality parameters i.e. calcium.

Table No 8Percentage distribution of individual surface TSIF scores of maxillary anterior teeth – (N = 150).

|	0	1	2	3	4.6
All	60.2	35.5	7.5	4.2	6.5
Label maxillary anterior teeth	45.2	46.8	10.5	5.5	5.5

The above table represented that the clinical examination results which indicated that drinking water fluoride assay. These children with verified water fluoridation histories & deficient drinking water quality. Most of parents i.e. 99% reported that their children used a fluoride toothpaste.

Table No.8 Means & S.D. Value of water quality parameter i.e. Total Hardness

Water Quality parameters	Area of living	N	Mean	Std. Deviation	t-Test
Total Hardness	Rural	150	25.62	7.63	3.00
	Urban	150	22.99	7.53	

Graph No. 8 Mean & S.D. Value of water quality parameter i.e. Total Hardness
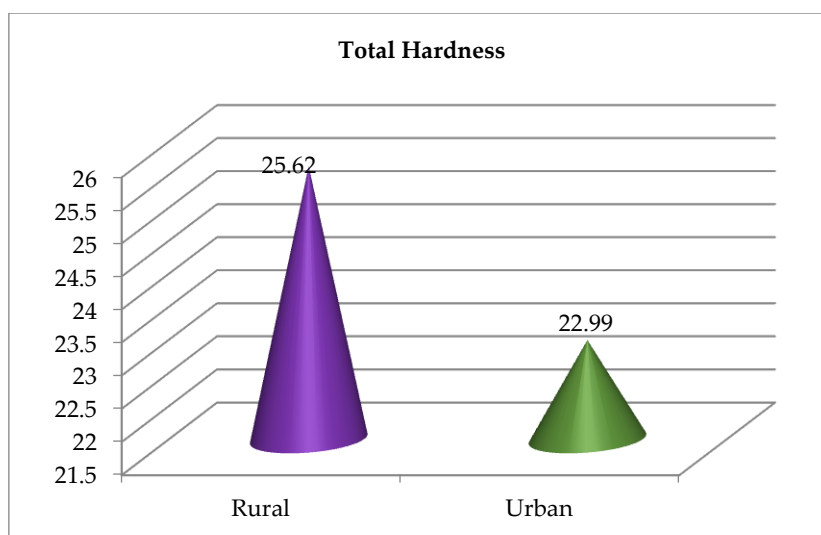
Total Hardness

The mean score (25.62) of rural area is higher than mean score (22.99) of urban area. It shows that there is significant difference between rural and urban area on health of people in terms of water quality parameter i.e. Total Hardness. The study result show that the mean score of rural areas i.e. 25.62 is higher than the mean score of urban 22.99 is significance difference between rural & urban area in terms of water quality parameters i.e. total hardness.

Conclusion

The bacterial contamination and presence of TDS, chloride, fluoride, calcium and hardness of water found higher in borehole and well water than tap water. It was also found that maximum no. of children affected with drinking fluoride deficientor polluted water.

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Conflicts of interest
There are no conflicts of interest.

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