

## Analysis of the understanding of the radiologists regarding PCPNDT Act and their perspective about its effects on society.

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**Abstract:** A research questions: containing set of 20 questions were designed to assess the level of understanding of the radiologists regarding PCPNDT Act and their perspective about changes brought about by the PCPNDT act over the years. The Setting was urban area under Navi Mumbai Municipal Corporation. The study was a cross sectional study. The study population comprised of 100 radiologists. The doctors were selected from among private practitioners and also those attached to Medical College hospitals and corporate hospitals in Navi Mumbai. The private practitioners included radiologists having their own setup and / or those employed with the ultrasound clinics in Navi Mumbai. The cross sectional study was conducted in Navi Mumbai district from June to August 2014. Statistical analysis was done using simple percentages obtained on the basis of answers selected by the radiologists from a questionnaire.

**Result:** This study observed that although there was a high compliance with the PCPNDT act, a significant percentage of doctors had only partially read the PCPNDT act. The knowledge regarding the PCPNDT act was imbibed mainly from whatever was instructed or informed by the appropriate authority and by their colleagues. Very few doctors understood the motive behind the rules laid down by law. Most doctors were of the opinion that the PCPNDT act should be continued although on its own it is not enough to curb female feticide.

**Key words:** Feticide, female child, sex ratio, PCPNDT act, Radiologists, Sonologists.

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### I. Introduction

The female to male sex ratio in India has been rapidly dwindling since 1961 according to the comparative chart of census shown in figure 1 and cited on web<sup>1</sup>. It is more so after 1981. Because of this Maharashtra state was the first in India to enact Prenatal Diagnostic Technique –PNDT (Regulation & Prevention of Misuse) act in 1988. The Central government enacted the PNDT act in 1994 which was later amended to Pre Conception and Pre Natal Diagnostic Technique ((Prohibition of Sex Selection) Act- PCPNDT in 1997 Act which underwent strict implementation only since 2000. This act underwent amendments many times later on<sup>2</sup>.

The figure no 1 shows there is decreasing sex ration since 1960 According to various reports, approximately 10 million female fetei have been subject to feticide over the last 20 years. Despite the implementation of the amended Pre-Conception and Pre-Natal Diagnostic Techniques Act (2003), there had been a steady decline in India's female sex ratio. Census 2011 data reveals that the number of girls per 1,000 boys in the 0-6 age-group dropped from 945 to 927 between 1991 and 2001. In some states, the sex ratio declined to less than 900 girls per 1,000 boys as shown in figure-2. In Maharashtra we could see a distinct drop of sex ratio in Marathwada region and some districts of western region from census data comparison of 2001 to 2011 as shown in figure-3 and table no1.

Maharashtra has an overall sex ratio of 925 females per 1000 males. It has increased from 922 to 925 during last decade. The top districts in Maharashtra according to 2011 census as shown in table no 1 are – Ratnagiri which stands top at 1123 females per 1000 males, Sindhudurg is at number two with 1037 females per 1000 males. The bottom three districts in Maharashtra according to sex ratio 2011 census are Mumbai with the lowest sex ratio of only 838 females per 1000 males<sup>1, 5</sup>. Mumbai sub-urban also has very low sex ratio of 857 females per 1000 males. Thane district in which Navi Mumbai metropolis is included had overall 880 females per 1000 males in 2011. In 2013, these figures improved to 1135 in Ratnagiri, 1077 in Sindhudurg, but worsened in Thane to 857 and Mumbai suburban dropped to 826 while the worst figure of 774 was of Mumbai district. A study done in 2013 in Jalna<sup>3</sup> had thrown shocking fact that 97% doctors confirmed that they got demand from patient and their family members to know the sex of foetus which showed the mentality of our society.

In recent times, Navi Mumbai has been declared to be among the topmost cities in the effective implementation of the PCPNDT act. It has one of the highest female to male sex ratio in Maharashtra which has increased from 898 in 2011-12 to 930 in 2013-14 in spite of the falling average sex ratio in Maharashtra, as shown in Table no 2. Abasaheb Jarhad, the NMMC commissioner stated in PTI news that even as the sex ratio in the state has recorded 894 girls per 1000 boys in 2013-14, the city's sex ratio has improved to 930 girls per

1000 boys. The girl child population has increased in the city owing to awareness campaigns against female feticide undertaken by the NMMCs health department and various other NGOs. In a bid to improve the sex ratio, the state government and social organizations have initiated campaigns to save the girl child. In these campaigns, the masses are educated about the importance of a girl child and why it is vital to ensure their safety and security. The Radiologists were specially thanked for their active co-operation in this drive.

The radiologists and or sonologists who perform ultrasound examinations have been actively involved in preventing female feticide and increasing the female sex ratio<sup>4</sup>. This study was performed to mainly assess the knowledge of the radiologists in Navi Mumbai regarding the PCPNDT act, their perspective of the effects of the strict implementation of this act causing social changes and to understand the need to continue the implementation of the act and various other means to increase female to male ration in the society.

## **II. Material And Methods**

### **2.1 Materials**

The study was conducted on randomly selected doctors. Before doing this study, permission from the Navi Mumbai – Raigad Chapter of Maharashtra State Branch of Indian Radiological & Imaging Association was taken along with clearances from ethical committee of Terna Medical College. The survey included radiologists or sonologists working in the private diagnostics centres, corporate hospitals and medical college run hospitals in Navi Mumbai district. These doctors were either owners practicing ultrasound themselves or sonologists employed at the registered centres or hospitals who were directly or indirectly handling the patients and hence were under the preview of the PCPNDT act directly.

### **2.2 Method**

Data collection was done using a questionnaire based on PCPNDT Guidelines. The doctors were given the option of staying anonymous if they preferred. Confidentiality was also strictly observed by de-identification of the questionnaire. It was statistically analyzed using percentages. The questionnaire was as printed under and the answers were as follows -

#### **2.2.1 Questions**

1. Name of the sonologist (optional): \_\_\_\_\_
2. Total years of experience in ultrasound practice: a (0-5 yrs), b (5-10 yrs), c (10-15 yrs), d ( more than 15 yrs).
3. Have you read the PCPNDT act completely? : a (fully), b ( partly), c (not at all).
4. When do you think it started ? a (1994) , b (2000), c (2004), d (do not know).
5. Do you know how many times it has been amended till now? :a (2), b (4), c (7),d (do not know).
6. Do you know the PCPNDT rules? : a (completely), b (incompletely), c (only what I hear from colleagues).
7. Have you put PCPNDT boards in your clinic? : YES / NO.
8. Have you displayed your degrees in your clinic? :YES / NO .
9. Where have you displayed the PCPNDT certificate in your clinic?: a (waiting room) ,b (sonography room), c (both ) .
10. Is PCPNDT rule book available for patients in your clinic? :a (yes), b (no).
11. Which staff of your clinic wears name plate and designation on their dress? :a (doctor), b (technician), c (both).
12. Whose instructions do you follow? :a (Appropriate Authority), b (colleagues), c (association), d (rule book).
13. Do you feel Sex Determination is still being done in spite of strict implementation in our region?: a (yes), b (no), c (do not know).
14. Do you think PCPNDT Act alone can stop female feticide by implementing it? : a (yes),b (should be combined with social awareness), c (combined with incentives for female child), d (combined with incentives for women delivering female child).
15. Are you aware of methods other than ultrasound which can be used for SD?: a (yes),b (no), c (a few).
16. Has anyone at your clinic come to you asking you to tell the fetal sex during a routine ultrasound in the past year? :a (yes), b (no) ,c (yes, but they were ignorant about the rules).
17. On a scale of 1 to 4, how would you grade the ease of filling form F?: a (1),b (2), c(3), d (4).
18. How do you think the paperwork for pregnancy ultrasound can be made easier?: a (no change needed), b (declaration form and register should suffice), c (only online forms should suffice).
19. Do you HONESTLY feel there is any relation between incompletely filled Form F and sex determination?: a (yes), b (no),c ( I want to know the relation).

20. Do you feel that the major violations of PCPNDT act should include clerical errors like incomplete filling of Form F?: a (yes), b (no, because it is only a clerical error), c(no, as long as the form F is filled online).
21. Any recommendations to deal with PCPNDT rules without adding to the stress levels.\_\_\_\_\_.

### **2.2.2 Answers**

1. As the declaration of name was optional , we did not consider for statistics.
2. Total years of experience in ultrasound practice:
  - a. (0-5yrs) 33%, b. (5-10yrs) 27%, c. (10-15 yrs )15%
3. Have you read the PCPNDT act completely?
  - a. (fully ) 27% , b. ( partly ) 66%, c. (not at all )6%
4. When do you think it started?
  - a. (1994) 70% , b.(2000) 18%, c. (2004) 6% , d (do not know) 6%.
5. Do you know how many times it has been amended till now?
  - a.( 2) 30%, b.(4) 61 % , c.( 7) 6%, d. (do not know) 6%
6. Do you know the PCPNDT rules ?
  - a.(completely) 30%, b. (Incompletely) 45%,c.(only what I hear from colleagues )19%.
7. Have you displayed PCPNDT boards in your clinic?
  - a. YES 96%, b. NO 4%.
8. Have you displayed your degrees in your clinic?
  - a. YES 96%, b. NO 4%.
9. Where have you displayed the PCPNDT certificate in your clinic?
  - a.(waiting room) 4%, b.(sonography room) 6%, c.(both) 90%.
10. Is PCPNDT rule book available for patients in your clinic?
  - a. yes 84% ,b. no. 16%.
11. Which staff of your clinic wears name plate and designation on their dress?
  - a. (doctor) 12%, b.(technician) 60%, c.(both) 28%
12. Whose instruction do you follow?
  - a.(Appropriate Authority) 37%, b.(colleagues) 21%, c.(association) 21%,d.(rule book) 21%
13. Do you fill SD is still being done in spite of strict implementation in our region?
  - a.(yes) 15%, b. (no) 30%, c.(do not know) 55%.
- 14.DO you think PCPNDT act alone can stop female feticide by implementing it?
  - a.(yes) 6%, b.(should be combined with social awareness) 62%, c.(combined with incentives for female child.) 12%, d.(combined with incentives for women delivering female child) 20%
- 15.Are you aware of methods other than ultra sound which can be used for SD?
  - a. (yes) 48%, b. (no ) 27%, c. (a few) 21%
- 16.Has anyone at your clinic requested you to tell the fetal sex during a routine ultrasound in spite of knowing the rules?
  - a. (yes ) 46 % , b. (no) 36%, c.( yes,but they were ignored about the rules) 18%
17. On a scale of 1 to 4, with 1 being most easy and 4 meaning most difficult, how would you grade the ease of filling form F?
  - a. (1) 16%, b.(2 ) 33%, c. (3) 21%, d. (4 ) 30%
- 18.How would you think the paperwork for pregnancy ultrasound can be made easier?
  - a. ( no change needed) 6%, b.( declaration form and register should suffice ) 30%, c.(only online forms should suffice) 61%.
19. Do you honestly feel there is any relation between incompletely filled form F and sex determination?
  - a. (yes ) 5%, b. (no) 75%, c. (Do not Understand the relation) 20%.
- 20.Do you feel that the major violations of PCPNDT act should include clerical errors like incomplete filling of form F?
  - a. ( yes ) 0%, b. ( no, because it is only clerical error ) 66%, c. ( no, as long as the form F is filled online ) 34%.

### **III. Discussion**

The present study revealed that 27% of the doctors had an average experience of 5-10 years. 15% of the doctors had an experience of more than 15 years. Although the knowledge about PCPNDT act among doctors was adequate, very few doctors had actually read the complete rule book. Almost 66% of the doctors admitted to having read the PCPNDT act only partially and 27 % of the doctors said that they knew the complete PCPNDT rules. Most of the doctors were just following the guidelines sincerely which were conveyed to them verbally by the appropriate authority, association or colleagues.

15% of the doctors felt that fetal sex determination is still being performed in spite of the strict implementation of the PCPNDT law. 15% of the doctors felt that sex determination was still being performed in Navi Mumbai. Only 6% of the radiologists felt that the PCPNDT act alone can stop female feticide. 62% of the radiologists felt that the PCPNDT act should be combined with the social awareness for achieving the purpose.

In a research done in Kolkata by Parthasarathi Mitra et al <sup>6</sup>, it is documented fact that the pregnant women and their family members are aware of the PCPNDT act but still want to know the sex of foetus. In our study 46% of the doctors admitted that over the last year they had been approached by patients for foetal sex determination during routine ultrasound examination, although 18% said that it was out of ignorance about the rules. As 46% of the doctors admitted that patients do still ask them for the foetal sex, there is also a strong need to increase the awareness among the public about the importance of this act. Of course, many of them may be asking the question more out of curiosity rather than for termination of female foetus. However, the importance of a female in the society dominated by males needs to be addressed by socio- psychological awakening of the masses all over India.

48% of the radiologists were aware of the methods other than ultrasound which could be used for prenatal sex determination but followed the rules and did not divulge it to patients.

61% of the doctors were of the opinion that only online forms should suffice instead of all the paper work that is presently being done. 30% of the doctors were of the opinion that a declaration form and register would be adequate.

None of the doctors were of the opinion that clerical errors in filling of form F should be included under major violations of the PCPNDT act as it was a human error and completely unintentional. 34% of the doctors felt that if the form F is filled online, then clerical errors in manual F forms should not be considered as an offence.

75% of the doctors did not see any relation between incompletely filled form F and sex determination. 20% of the doctors wanted to be explained the relation between the two. However, all of them agree that there is need to continue the strict monitoring for some more time.

#### IV. Figures And Tables

*Table no : 1*

**Sex Ratio in Maharashtra : District wise Index in ascending order.**

SR.NO.	DISTRICT	FEMALE THOUSAND 2001	PER MALE	FEMALE THOUSAND 2011	PER MALE	FEMALE THOUSAND MALE 2013
1.	MUMBAI	777		838		774
2.	MUMBAI (SUBURBAN)	822		857		826
3.	THANE	858		880		857
	PUNE	919		910		917
5.	BEED	936		912		927
6.	AURANGABAD	925		917		919
7.	OSMANABAD	932		920		930
8.	JALGAON	933		922		932
9.	LATUR	935		924		934
10.	WASHIM	939		926		939
11.	BULDANA	946		928		946
12.	JALNA	951		929		952
13.	NASHIK	927		931		924
14.	SOLAPUR	935		932		937
15.	AHMADNAGAR	940		934		941
16.	HINGOLI	953		935		953
17.	NANDED	942		937		943
18.	PARBHANI	958		940		957
19.	DHULE	944		941		945
20.	AKOLA	938		942		938
21.	WARDHA	935		946		936
22.	AMRAVATI	938		947		940
23.	YAVATMAL	942		947		942
24.	NAGPUR	932		948		933
25.	KOLHAPUR	949		953		949
26.	RAIGAD	976		955		975
27.	CHANDRAPUR	948		959		961
28.	SANGALI	957		964		957
29.	NANDURBAR	977		972		975
30.	GADCHIROLI	976		975		976
31.	BHANDARA	981		984		982
32.	SATARA	995		986		995
33.	GONDIYA	1005		996		1005



34.	SINDHUDURG	1079	1037	1077
35.	RATNAGIRI	1136	1123	1135

**Table no 2:**  
**Official graph by Navi Mumbai Municipal Corporation showing increase of sex Ration in Navi Mumbai**

STRIKING A BALANCE : THE WAY FORWARD		OFFICIAL SPEAK
SAVE THE GIRL CHILD		"The girl child population has increased in the city owing to awareness campaigns against female feticide undertaken by the NMMCs health department and various other NGOs. I am glad Navi Mumbai's sex ratio has improved significantly that it has bagged the second spot in the state. The credit for this goes to civic officials and peoples representatives, who have put their efforts." ABASAHEB JARHAD,(NMMC commissioner)
YEAR	RATIO OF GIRL CHILD (per 1000 boys)	
2002	849	
2010-11	898	
2011-12	900	
2012-13	899	
2013-14	930	
<b>MAHARASHTRA</b> Ratnagiri Municipal Council tops the state with the best sex ratio, while the Navi Mumbai Municipal Corporation bags the second spot.		

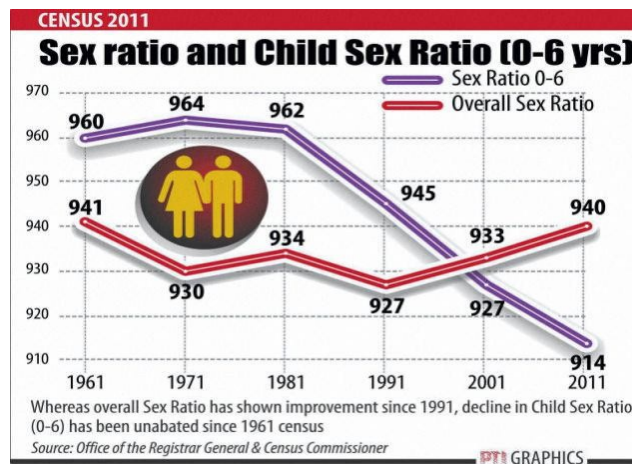


Figure no 1: Comparison of Census showing trends of sex ratio in India from 1961 to 2011

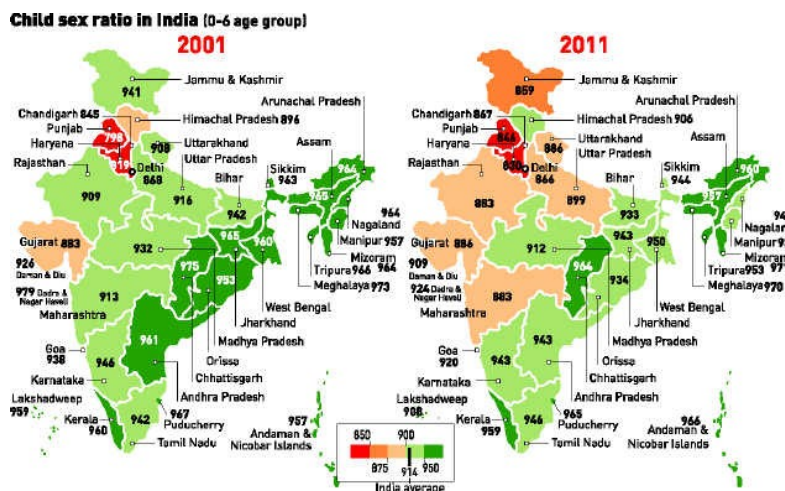


Figure no 2: Maps of India showing state wise sex ration in 2001 and 2011.

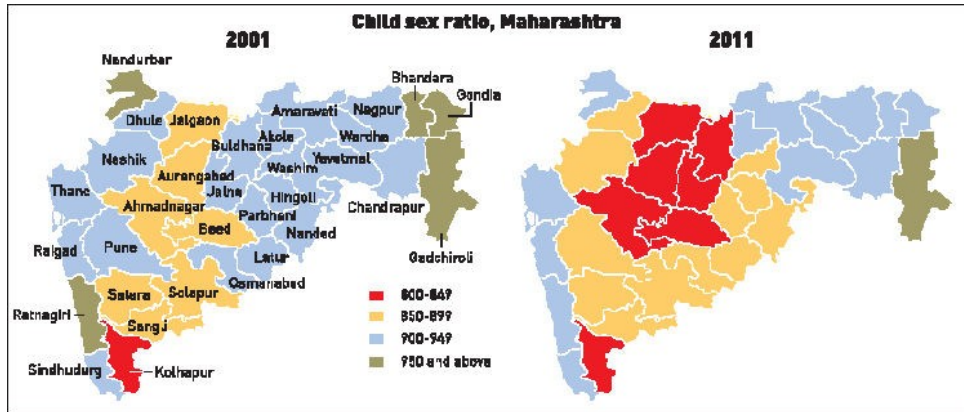


Figure no 3: Maps of Maharashtra showing district wise sex ration in 2001 and 2011.

Child sex ratio in Maharashtra districts (Census 2011)			
District	2001	2011	Difference 2001-2011
Thane	931	918	-13
Raigad	939	924	-15
Ratnagiri	952	940	-12
Sindhudurg	964	910	-34
Nashik	920	882	-38
Dhule	907	876	-31
Nandurbar	961	932	-29
Jalgaon	880	829	-51
Ahmadnagar	884	839	-45
Pune	902	873	-29
Solapur	895	872	-23
Satara	878	881	3
Kolhapur	839	845	6
Sangli	851	862	11
Aurangabad	890	848	-42
Jalna	903	847	-56
Parbhani	923	866	-57
Hingoli	927	868	-59
Latur	918	872	-46
Osmanabad	894	853	-41
Beed	894	801	-93
Nanded	929	897	-32
Akola	933	900	-33
Washim	918	859	-59
Amravati	941	927	-14
Yavatmal	933	915	-18
Buldhana	908	842	-66
Nagpur	942	929	-13
Wardha	928	916	-12
Bhandara	956	939	-17
Gondia	958	944	-14
Chandrapur	939	945	6
Gadchiroli	966	956	-10
Mumbai (sub)	923	910	-13
Mumbai	922	874	-48
<b>State total</b>	<b>913</b>	<b>883</b>	<b>-30</b>

Note: Child sex ratio is the number of girls per 1,000 boys in the 0-6 age group.

Figure no 4 : Chart showing difference in District wise Child sex ration from 0 – 6 years in Maharashtra state on comparing data of 2011 to 2011.

## V. Conclusions

This cross sectional study showed that compliance regarding PCPNDT act was high among radiologists in Navi Mumbai although most preferred to follow the guidelines conveyed to them by the appropriate authority, colleagues or the association.

There is an urgent need to sensitize the general public on PCPNDT act for effective implementation of law. All those involved in prenatal sex determination and female feticide including should be penalized and not just the doctors so that it can create fear amongst the potential offenders of the family of pregnant woman. The PCPNDT act should also apply to all the available techniques for sex determination and not just ultrasound.

Most of the doctors believed that preference for male child in Indian society<sup>6</sup> is the most common reason for increasing female feticide resulting in declining sex ratio. Until each person is aware of the need for increasing the female population, the purpose of the PCPNDT act is not achieved. This cannot be achieved solely by educating the public, but can be achieved by abolishing certain age old practices like dowry and increasing the benefits and incentives being given to the girl child.

Out of the 12 million girls born in India, one million die before the first year of life. Hence the phrase "Save the girl child" should be used not only for the unborn female foetus but also for a female child. Postnatal neglect of a female child in the form of gender-discrimination should hold a punishment equal to that of female feticide. Dowry, which is a punishable act, should be implemented in earnest. Incentives should be provided in the form of free meals and education at schools to the girl child of all classes and an assurance of safety in day to day life.

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