

Maternal Health Situation in Bihar and Madhya Pradesh: A Comparative Analysis of State Fact Sheets of National Family Health Survey (NFHS)-3 and 4

RANJIT KUMAR DEHURY¹, JANMEJAYA SAMAL²

ABSTRACT

Introduction: Maternal health constitutes the health of women during pregnancy, childbirth and the postpartum period. Bihar and Madhya Pradesh (MP) constitute the Empowered Action Group (EAG) states under National Rural Health Mission (NRHM) and are consistently having poor maternal health indicators.

Aim: The main objective of this study was to assess the maternal health situation of Bihar and MP based on National Family Health Survey (NFHS-3) and 4 fact sheets.

Materials and Methods: The study adopted a narrative description in which the NFHS fact sheets (NFHS-3 & 4) of both these states were obtained from appropriate sources and compared for various maternal health indicators.

Results and Discussion: Albeit progress has been observed from NFHS-3 to NFHS-4 however, the progress is very dismal compared with the progress of other similar Indian states. Relatively MP has shown better progress compared to Bihar. Poor performance is being observed in all the three levels of maternal health; pregnancy {Ante-Natal Care (ANC), Tetanus toxoid (TT) and Iron and Folic Acid (IFA)}, child birth (Institutional delivery by Skilled Birth Attendant (SBA), Caesarean Section (CS) and post partum care (hospital stay and Janani Suraksha Yojna (JSY). The poor performance of both these states in all these indicators requires multipronged approach strong political will, health system strengthening, community mobilization and awareness.

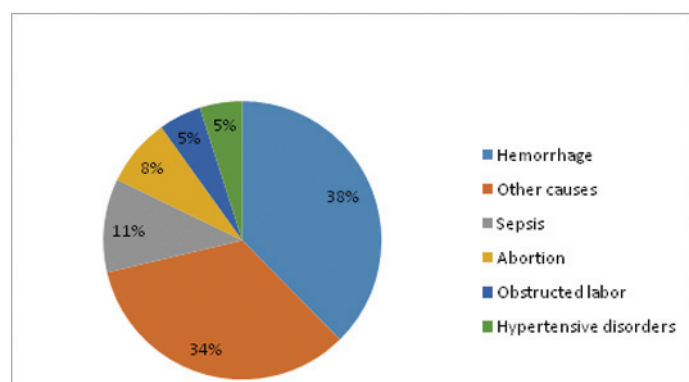
Conclusion: Given the status of maternal health in India and more especially in states BIMARU (Bihar, Madhya Pradesh, Rajasthan, Uttar Pradesh) and EAG states (Empowered action group), improvement in the performance of maternal health related activities is highly necessary.

Keywords: Antenatal care, BIMARU states, Delivery care, Empowered action group, Post partum care

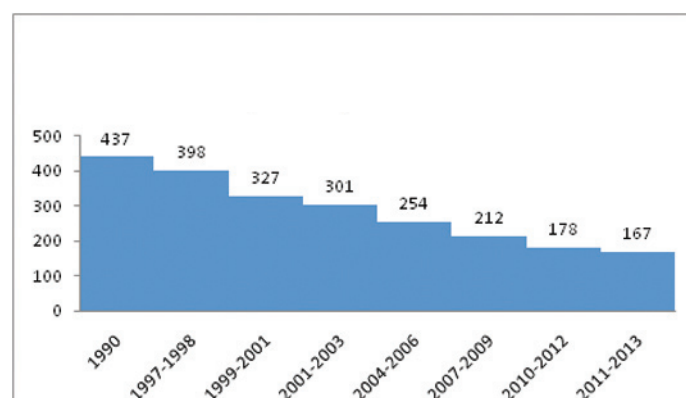
INTRODUCTION

Maternal health refers to the health of women during pregnancy, childbirth and the postpartum period [1]. Of these three important components, the state of pregnancy forms the foundation of maternity cycle and strongly influences the outcome of two other components; child birth and post partum care. Maternity cycle includes five important phases: (a) fertilization; (b) antenatal or prenatal period; (c) intra-natal period; (d) post natal period; and (e) inter-conceptual period [2]. Generally motherhood is mostly a positive and fulfilling experience in developed countries. However, the situation is not the same in many developing countries where motherhood is associated with suffering, ill-health and even death. The causes delineated for high mortality and morbidity

are haemorrhage, sepsis, high blood pressure, unsafe abortion and obstructed labour [1]. [Table/Fig-1] shows the percentage distribution of different causes of maternal death in India [3,4]. In Indian context the milieu of maternal health has always been a great public health concern. A great degree of variation is observed in maternal health indicators in India among different states, rural-urban distribution pattern, rich and poor socio-economic status and level of education and availability of health services. Maternal Mortality Ratio (MMR) is a measure used as a robust indicator to assess maternal health which is also used in India extensively for policy making [5]. According to Sample Registration System (SRS) the MMR in India stood at 167 per one lakh livebirths during the year 2011-2013. It has been found that most of the deaths occur



[Table/Fig-1]: Causes of maternal death in India.



[Table/Fig-2]: Trend of maternal death in India.

in the age group of 20-24 years [6]. [Table/Fig-2] shows the trend of MMR in India. Variation in MMR in different Indian states shows a wide gap, which ranges from 285 in Uttar Pradesh, being the highest, to 61 in Kerala, being the lowest [6]. The current rate of reduction of MMR in India is 5.5% and has achieved around 62% reductions toward the target of 109 by 2015 [7]. Based on health, education and infrastructure; the planning commission of India has defined MP and Bihar in third tier states also known as BIMARU states [8]. With this background an assessment was aimed based on the National Family Health Survey (NFHS-3) & 4 fact sheets to understand the maternal health situation in two Indian states; Bihar and MP.

AIM

The main objective of the study was to assess the maternal health situation of Bihar and Madhya Pradesh based on NFHS-3 and NFHS-4 data sheets.

MATERIALS AND METHODS

The study adopted a narrative description in which the NFHS fact sheets of both these states were obtained from appropriate sources [9,10]. The data sets were compared with each other (NFHS-3 and NFHS-4) for various maternal health indicators in both these states. The indicators compared in this study includes Ante-Natal Care (ANC) services, performance in anaemia and neonatal tetanus, performance in mother and child protection card, post natal care, JSY and out-of-pocket expenditure, skilled birth attendance and delivery services. For the purpose of comparative analysis percentage distribution tables were plotted. The NFHS data is collected during the year 2014-2015 in the state of Bihar and Madhya Pradesh.

RESULTS

Antenatal check-up is an important event for better maternal healthcare throughout pregnancy. There are 4 mandatory ANC visits required for optimal maternal care. Further, attending ANC in first trimester has a positive impact on the health of mother. Both Bihar and MP has shown increase of antenatal check-up percentage from NFHS-3 to NFHS-4, from 18.7% to 34.6% in Bihar and 39.33% to 53.1% in MP. The data infers that in MP more than half of the pregnant women received ANC services during first trimester in comparison to only one third of the women of Bihar. While considering at least 4 ANC visits for the pregnant mother, it is found that both the states fare poorly in NFHS 4 data. MP managed to increase the percentage change by more than 10% from NFHS 3 to NFHS 4 in comparison to abysmal performance of Bihar which is around 2% only. The details of the trend are shown in the [Table/Fig-3] [9,10].

Both Bihar and MP shows around 10 percentage increase of protection of mother against tetanus. In Bihar the consumption of Iron and Folic Acid (IFA) is much lower, one-tenth of women are protected against anaemia in comparison to around a quarter of women for MP, as per the NFHS-4 data. Further, MP is able to increase the IFA by almost 3 times compared to NFHS-3. The detailed trend is shown in the [Table/Fig-4] [9,10].

Full ANC is defined as a package of at least four antenatal visits, at least one Tetanus Toxoid (TT) injection and provision of IFA

State	NFHS-3	NFHS-4
Mothers who had antenatal check-up in the first trimester (%)		
Bihar	18.7	34.6
Madhya Pradesh	39.33	53.1
Mothers who had at least 4 antenatal care visits (%)		
Bihar	11.2	14.4
Madhya Pradesh	22.3	35.7

[Table/Fig-3]: Percentage of mothers who received ANC services.

tablets or syrup for 100 or more days for care of the pregnant women. While MP managed to increase full ANC by around 6% from NFHS-3 to NFHS-4 Bihar shows a negative trend for this component during the same survey period. The detailed trend is shown in the [Table/Fig-5] [9,10].

The introduction of Mother and Child Protection (MCP) card is an attempt to monitor the status of maternal health more rigorously. Evaluation of this component is one of the attempts by NFHS-4 which brings out the compliance of care and maintenance of record. MP fares better than Bihar in the provision of the MCP card to the pregnant mothers by almost 12%. The detailed trend is shown in [Table/Fig-6] [9,10].

It has been found that receiving post-natal care during first 2 days after delivery minimizes maternal morbidity and mortality. Both Bihar and MP has shown improvement in the provision of postnatal care from doctor/nurse/LHV/ANM/midwife/other health personnel from NFHS-3 to NFHS-4. MP shows better performance by 12% compared to Bihar. However, around half of the women still deprived of the early post-natal care. The detailed trend is shown in the [Table/Fig-7] [9,10].

NFHS-4 data confirms that MP is faring well in providing Janani Suraksha Yojna (JSY) benefits to the pregnant mothers than Bihar. Further, a pregnant woman in Bihar incurred more out of pocket expenditure for a delivery than her counterpart in MP. Despite provision of free services under JSY they have to spend on an average Rs. 1724 and Rs. 1387 in Bihar and MP respectively. The detailed trend is shown in the [Table/Fig-8] [9,10].

It is observed that a low rate of care is being provided to the children born at home by regular check-up by health facilities within 24 hours of birth in both the states. The increase is very marginal between NFHS-3 and NFHS-4. The care given by doctor/nurse/LHV/ANM/ midwife/other health personnel within 2 days of birth is only around one-tenth for Bihar and one-fifth for MP. The detailed trend is shown in the [Table/Fig-9] [9,10].

State	NFHS-3	NFHS-4
% of mothers whose last birth was protected against neonatal tetanus		
Bihar	73.2	89.6
Madhya Pradesh	70.7	89.8
% of mothers who consumed IFA for 100 days or more when they were pregnant		
Bihar	6.3	9.7
Madhya Pradesh	7.1	23.6

[Table/Fig-4]: Percentage of mothers who are protected from neonatal tetanus and anaemia.

State	NFHS-3	NFHS-4
Mothers who had full ANC (%)		
Bihar	4.2	3.3
Madhya Pradesh	4.7	11.4

[Table/Fig-5]: Percentage of full antenatal care in Bihar and MP as per NFHS-3&4 data.

State	NFHS-4
Bihar	79.9
Madhya Pradesh	92.2

[Table/Fig-6]: Percentage of registered pregnancies for which the mother received Mother and Child Protection (MCP) card.

State	NFHS-3	NFHS-4
% of mothers who received postnatal care from a doctor/nurse/LHV/ANM/midwife/other health personnel within 2 days of delivery		
Bihar	13.4	42.3
Madhya Pradesh	24.9	55.0

[Table/Fig-7]: Percentage of women who received post-natal care.
*ANM-Auxiliary Nurse Midwife, LHV-Lady Health Visitor

The institutional delivery in both Bihar and MP has increased substantially as reported by NFHS-4 compared to NFHS-3 which is estimated to be three times during the study period. This may be due to focused execution of JSY. However, MP shows 16% more increase in institutional delivery than Bihar as reported by NFHS-4. For the institutional deliveries public health institutions play important role by contributing to major chunk of births in both the states in which MP fares well than Bihar by almost 20% increase. The percentage of home deliveries to total deliveries is low in both the states and has been decreasing and is a good sign that people in both these states are adopting institutional delivery. There is marked achievement regarding deliveries conducted by doctor/nurse/LHV/ANM/other health personnel in both the states which is almost double between NFHS-3 and NFHS-4. However, the performance of MP is 8% higher compared to Bihar in NFHS-4. This is an indication that deliveries are being conducted by the skilled birth attendants in both these states. Both Bihar and MP shows marginal increase in the Caesarean Section (CS) deliveries. However, there is high rate of CS deliveries being conducted in private facilities than in public facilities in both these states between

State	NFHS-4
% of mothers who received financial assistance under JSY for births taken place in an institution	
Bihar	53.9
Madhya Pradesh	61.1
Average out of pocket expenditure per delivery in public health facility (Rs.)	
Bihar	1,724
Madhya Pradesh	1,387

[Table/Fig-8]: Percentage of women who received financial assistance under JSY and incurred out of pocket expenditure.

State	NFHS-3	NFHS-4
% of children born at home who were taken to a health facility for check-up within 24 hours of birth		
Bihar	0.4	1.8
Madhya Pradesh	0.2	2.5
% of children who received a health check after birth from a doctor/nurse/LHV/ANM/ midwife/other health personnel within 2 days of birth		
Bihar	NA	10.8
Madhya Pradesh	NA	17.5

[Table/Fig-9]: Percentage of Children who received care at health centre and by skilled health care personnel.

NFHS-3 and NFHS-4. The detailed trend is shown in the [Table/Fig-10] [9,10].

DISCUSSION

From the latest NFHS-4, it is clearly evident that the progress in maternal health indicators in the states of Bihar and MP has not achieved as expected. Bihar is still having a dismal picture as far as the maternal health situation is concerned however, MP is in progressive track compared to Bihar [9,10]. Improvement of the indicators delineated above in the results section is of utmost importance for the improvement of maternal health status in any state, so also MP and Bihar.

Provision of ANC helps in the maintenance of safe motherhood. ANC consists of various routine clinical examinations and investigations for assessing healthy motherhood. It would provide a clue for early intervention in case of abnormality. For which four mandatory ANCs are required at different stages of labour. In India especially the interventions for anaemia is done during pregnancy. TT and IFA tablets are being provided regularly for the maintenance and well being of pregnancy. World Health Organization guidelines emphasize on the regular ANC check-ups. The current NFHS-4 data showing dismal picture of maternal health indicators is a matter of

State	NFHS-3	NFHS-4
% of institutional deliveries		
Bihar	19.9	63.8
Madhya Pradesh	26.2	80.8
% of institutional births in public facilities		
Bihar	3.5	47.7
Madhya Pradesh	18.4	69.5
% of home deliveries conducted by skilled birth attendants (SBA)		
Bihar	9.7	8.2
Madhya Pradesh	6.6	2.3
% of births assisted by a doctor/nurse/LHV/ANM/other health personnel		
Bihar	29.3	70.0
Madhya Pradesh	32.7	78.1
% of total caesarean section deliveries		
Bihar	3.1	6.2
Madhya Pradesh	3.5	8.6
% of caesarean section in private facilities		
Bihar	17.2	31.0
Madhya Pradesh	28.8	40.8
% of caesarean section public health facilities		
Bihar	7.6	2.6
Madhya Pradesh	6.8	5.8

[Table/Fig-10]: Percentage of delivery Care.

concern for both Bihar and MP. Relatively the performance of Bihar is a matter of great concern for the low turn up regarding mandatory four ANC as compared to MP. Similar studies in Bihar show that there is less utilization of maternal health care services like ANC and health centre visits [11,12]. In MP many socio-economic factors are reported to be responsible for the low outcome of maternal health indicators. In MP religion, income, wealth distribution, age at marriage and education play a great role in availing maternal health services [13]. A study in EAG states based on the District Level household Survey (DLHS) shows, that the presence of health facility is necessary but is not adequate to promote utilization till the quality of services is adequate and accessible which is shown by the inter-district variation [14]. Various studies also confirm that socio-economic and demographic factors play an important role in the utilization of health services than mere accessibility of health care facilities [15-17].

Following regular ANC the care of the impending mother during the process of parturition is of utmost importance from the perspective of maternal health and neonatal health which is greatly dependent upon the outcome of the process of parturition and the preceding care during antenatal period. Needless to mention that compared to home deliveries institutional deliveries end up with more success without or minimal complications in delivery outcome. However, owing to lack of resources in India practice of home deliveries are still prevalent in far flung places and rural areas. Bihar and MP are the category of EAG states where referral networks are not well developed. The current NFHS- 4 data shows dismal performance of institutional deliveries and home deliveries are being conducted without or minimal assistance of the SBA and required medical and paramedical professionals. Despite much of the training activities of health care professionals in Integrated Management of Neonatal and Childhood Illnesses (IMNCI) and SBA their ground level intervention is abysmally poor which ultimately affect the health of rural pregnant women in terms of higher maternal morbidity and mortality. A similar study in Rewa district of MP shows lack of birth preparedness and readiness for complications during pregnancy [18]. Bihar also shows lack of care during child birth and post-natal care [9]. A study in Bihar by using DLHS-3 data shows that 37% women received IFA tablets

during pregnancy. Whereas, only 24% women utilize IFA for 90 days or more [19]. As per the reports of another study 60% of the pregnant women in Bihar suffer from anaemia [20].

Similarly, neonatal care is of utmost importance from the perspective of maternal health and the survival of the baby as well. The baby needs immediate care after birth and the initial days are very much crucial from the child survival point of view. Hence, institutional care with the help of concerned specialists is required for the survival and well being of the baby. Contrary to this the situation of Bihar and MP shows dismal performance in the care of neonates within first two days. Relatively the performance of Bihar is worsas with the performance of MP. A similar study at pan India level also shows poor provisioning of neonatal care [21]. Furthermore, a meta-analysis by UNICEF-PHFI revealed greater concern for neonatal care in India [22].

The Caesarean Section (CS) deliveries are more in private hospitals which seems to be very high compared to the standards set by WHO as reported by NFHS-3 and 4 data. There might be some erratic assessment of the cases for caesarean section delivery. In both Bihar and MP this is a common phenomenon. As the proportion of CS deliveries are more common in private sector it gives one indication that the private hospitals are more inclined towards CS deliveries and is most likely for the purpose of money minting. It may also happen that the low level of CS deliveries in public sector is an indication of lack of competent health work force in the form of specialists; both obstetricians and the Anaesthetists as well. Hence, necessary steps needs to be taken to deploy required number of specialists so that CS deliveries could be conducted as and when needed.

RECOMMENDATION

Bihar has to mobilize more resources for the improvement of maternal health as many of the indicators are very poor, whereas, MP has to consolidate the achievement in some of the indicators and accelerate others for the achievement of maternal health targets. As ANC plays a pivotal role in the health of pregnant women, both Bihar and MP has to focus on the mobilization of women in rural area for this. Besides promoting institutional delivery, the delivery by Skilled Birth Attendants have to be increased in hard to reach areas mostly in tribal areas for minimization of the mortality and morbidity of pregnant women. The provision of basic services by ANM and ASHA workers like distribution of IFA tablets, micronutrients, prevention from tetanus could promote health in both the states. These grass root level workers could also counsel and impart IEC activities for utilization of maternal health services. The grass root level workers have to visit the pregnant women in both antenatal and post-natal stages with requisite medical aid. The CS deliveries have to be reduced immediately by assessing the pregnant women by specialists because this impacts both health of women and socio-economic condition of family. The private sector must be regulated for the unwanted CS delivery.

CONCLUSION

Given the status of maternal health in India and more especially in BIMARU or the EAG states improvement in the performance of maternal health related activities is highly necessary. The improvement is required in all aspects of maternal health,

pregnancy, child birth and post partum care. Health system strengthening coupled with strong political will and community mobilization are some of the urgent strategies required in states like Bihar and MP. As per various reports the median age at marriage in Bihar and MP is below the legal age at marriage in India which leads to early child birth resulting in various maternal health complications. Above all community awareness has a greater role in improving the health status in these two states besides other efforts.

REFERENCES

- [1] World Health Organization. Health Topics, Maternal Health http://www.who.int/topics/maternal_health/en/ [Last accessed on 16/01/2016].
- [2] K Park. Park's Text Book of Preventive and Social Medicine. Jabalpur: M/s Banarsidas Bhanot Publishers; 2011.
- [3] Montgomery AL, Ram U, Kumar R, Jha P. for The Million Death Study Collaborators Maternal Mortality in India: Causes and Healthcare Service Use Based on a Nationally Representative Survey. *PLoS ONE*. 2014;9(1):e83331.
- [4] RGI (2006) Registrar General/Centre for Global Health Research, University of Toronto. New Delhi: Registrar General of India.
- [5] Kuppusamy K, Rajarathinam MK. Tracking progress towards health related millennium development goals in India. *Int J Med Public Health*. 2015;5:253-58.
- [6] MMR Bulletin, 2011-13. Sample Registration System. Office of Registrar General India. Available from: http://www.censusindia.gov.in/vital_statistics/mmr_bulletin_2011-13.pdf. [Last accessed on 15/11/2015].
- [7] World Health Organization. World Health Statistics 2014. Geneva: WHO; 2014. Available from: http://www.who.int/gho/publications/world_health_statistics/2014. [Last assessed on 15/01/2016].
- [8] Bhandari P. Refining State Level Comparisons in India; 2012. http://planningcommission.nic.in/reports/articles/article_state.pdf.
- [9] International Institute for Population Sciences. National Family Health Survey-4, State fact sheet Madhya Pradesh, 2015 -16: India. Mumbai: IIPS; 2016. Retrieved from: http://rchiips.org/NFHS/pdf/NFHS4/MP_FactSheet.pdf.
- [10] International Institute for Population Sciences. National Family Health Survey-4, State fact sheet Bihar, 2015 -16: India. Mumbai: IIPS; 2016. Retrieved from: http://rchiips.org/NFHS/pdf/NFHS4/BR_FactSheet.pdf.
- [11] Kumar GA, Dandona R, Chaman P, Singh P, Dandona L. A population-based study of neonatal mortality and maternal care utilization in the Indian state of Bihar. *BMC Pregnancy and Childbirth*. 2014;14:357.
- [12] Barrick L, Koenig MA. Pregnancy Intention and Antenatal Care Use in Two Rural North Indian States. *World health & population*. 2008;10(4):21-37.
- [13] Jat TR, Ng N, San Sebastian M. Factors affecting the use of maternal health services in Madhya Pradesh state of India: a multilevel analysis. *International Journal for Equity in Health*. 2011;10:59.
- [14] Patel R, Ladusingh L. Do physical proximity and availability of adequate infrastructure at public health facility increase institutional delivery? a three level hierarchical model approach. Sahasrabudde V, ed. *PLoS ONE*. 2015;10(12):e0144352. doi:10.1371/journal.pone.0144352.
- [15] Marmot MG, Rebecca F, Susan LE, Nadine EM, Larry LB, Carol DR. Contribution of psychosocial factors to socio-economic differences in health. *The Millbank Quarterly*. 1998;76(3):403-48.
- [16] Kandel DB, Gebre-Egziabher K, Schaffran C, Hu MC. Racial/ethnic differences in cigarette smoking initiation and progression to daily smoking: a multilevel analysis. *American Journal of Public Health*. 2004;94(1):128-35.
- [17] Gage AJ, Guirle Calixte M. Effects of the physical accessibility of maternal health services on their use in rural haiti. *Population Studies*. 2006;60(3):271-88.
- [18] Kushwah SS, Dubey D, Singh G, Shivdasani JP, Adhish V, Nandan D. Status of birth preparedness & complication readiness in Rewa District of Madhya Pradesh. *Indian Journal of Public Health*. 2008;53(3):128-32.
- [19] Wendt A, Stephenson R, Young M, et al. Individual and facility-level determinants of iron and folic acid receipt and adequate consumption among pregnant women in rural Bihar, India. Resch SC, ed. *PLoS ONE*. 2015;10(3):e0120404.
- [20] International Institute for Population Sciences (IIPS), Macro International. *National Family Health Survey (NFHS-3), 2005-06: India*. Mumbai: IIPS; 2007.
- [21] Singh A, Yadav A, Singh A. Utilization of postnatal care for newborns and its association with neonatal mortality in India: An analytical appraisal. *BMC Pregnancy and Childbirth*. 2012;12:33.
- [22] Gogia S, Ramji S, Gupta P, Gera T, Shah D, Mathew JL, et al. Community based newborn care: a systematic review and meta-analysis of evidence: UNICEF-PHFI series on newborn and child health, India. *Indian Pediatrics*. 2011;48(7):537-46.

PARTICULARS OF CONTRIBUTORS:

1. Faculty, Department of Healthcare Management, Goa Institute of Management, Panaji, Goa, India.
2. Independent Public Health Researcher, Based in Pune, Maharashtra, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Ranjit Kumar Dehury,
Faculty- Health Care Management Area, Goa Institute of Management Panaji, Ribander Campus - 403006, Goa, India.
E-mail: ranjit@gim.ac.in

FINANCIAL OR OTHER COMPETING INTERESTS: None.

Date of Submission: **Jan 26, 2016**

Date of Peer Review: **Feb 20, 2016**

Date of Acceptance: **Mar 15, 2016**

Date of Publishing: **Sep 01, 2016**