

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Disparity in maternal, newborn and child health services in high focus states in India: a district-level cross-sectional analysis
AUTHORS	Awasthi, Ashish; Pandey, CM; Chauhan, Rajesh; Singh, Uttam

VERSION 1 - REVIEW

REVIEWER	Prof. Udaya S Mishra Centre for Development Studies, Trivandrum Kerala India
REVIEW RETURNED	10-Oct-2015

GENERAL COMMENTS	<p>This article is motivated by availability of a new set of information at district level for the high focus states of India. It is a good attempt at utilizing this information set towards gauging disparities in MCH services and associating such disparities with disparities in socio-economic development. While an exercise of this kind has a scope of offering an understanding of the regional dynamics of disparity in MCH outcomes, it needs to have the required rigour in the analysis and based by a sound premise of literature.</p> <p>This exercise sounds like to building a connection between two dis-associated pillars. First of all the two indexes proposed are computed on two different principles and therefore can not be can not be contrasted against each other. The first index is based on the attainment criterion and the second on comparative criterion.</p> <p>As regard associating two dimensions, distributional analysis becomes ideal to infer the strength and dynamics of such association. A simplistic index of socio economic development with a set arbitrarily chosen indicators makes any inference based on it to be less robust. it is necessary to justify these set of indicators and their relevance with MCH care.</p> <p>The analysis is based on application of correlation and regression methods which is perhaps not adequate to conclude anything significant and for that matter it has not facilitated any unique observation at the end. The conclusion of the paper sounds trivial and merits no attention.</p>
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REVIEWER	Dr Vinod K Srivastava Professor & Head Department of Community Medicine Hind Institute of Medical Sciences Barabanki, Lucknow Metro, UP, India
REVIEW RETURNED	17-Dec-2015

GENERAL COMMENTS	<p>The aim of the study is to examine the variation in coverage rates of a key set of interventions of maternal and child health services..... However, authors have not provided any detail/contents of these interventions.</p> <p>It is said that the data has been analyzed in the districts of High focus states of India, however, there is no mention as what is meant by High Focus states and how it differs from other states.</p>
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REVIEWER	<p>Ali Mehryar Karim JSI Research & Training Institute, Inc. Washington DC, USA</p>
REVIEW RETURNED	09-Jan-2016

GENERAL COMMENTS	<p>The write-up of the paper is very poor, and a major part of the analysis is unclear. CGI and SEDI were measured from two different data sources (the former from AHS and the latter from census). As such, to conduct a correlation between the two measurements one had to link the AHS respondents with their data from the census. Given the sample sizes in Table 3, it is unlikely that individual-level data from the AHS were linked with individual-level data from the census (in which case the sample sizes in Table 3 would have been much larger). The most plausible explanation is that the CGI and SEDI measures were an aggregate at a higher level (e.g., enumeration area or village) and then linked with each other to seek the correlations. Nevertheless, these explanations were not given in the paper.</p> <p>Assuming that correlations presented between CGI and SEDI in the paper were at the community-level (village or enumeration unit) it should be noted that interpretation of the individual-level and community-level correlations are not exactly the same. The paper is presented as if the correlations were sought at the individual-level.</p> <p>My concerns on the poor write-up are below drawn from abstract and introduction sections only:</p> <p>Abstract (pages 2 & 3):</p> <ul style="list-style-type: none"> • The authors use the terms 'CGI', 'SEDI', 'high focus states in India' etc. as if the readers should know what they are. The methods section does not give any idea how the 'CGI' and 'SEDI' were measured. • The word 'linkage' is not an appropriate term to indicate 'association' or 'correlation' (page 2, line 41). • After reading the main text I am not convinced that CGI and SEDI are measurements of disparity. What I understood CGI is another way of defining coverage (i.e., 100 minus actual coverage in percentage points) while SEDI is used to classify individuals according to their socio-economy. Thus disparity measures would be differentials in CGI by another factor (for example, by urban rural, or by district, or by SEDI etc.) . • Cronbach's alpha was used test the reliability (page 2, line 41). ... reliability of what? • Is Cronbach's alpha a 'test'? The term 'test' usually means testing a hypothesis. Assessment is a better word here. • Observing trend was part of the objective indicated in the abstract; however the results section of the abstract does not reflect it. • The regression findings presented in the last sentence of the results section of the abstract could not be found in the main text.
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	<p>Why is beta positive for a negative association?</p> <ul style="list-style-type: none"> • First sentence of the conclusion section of the abstract is not derived from the findings of this study. <p>Introduction:</p> <ul style="list-style-type: none"> • First sentence is incomplete. • Dis-junction between statements of conclusions and data presented. For example, the second last sentence of the first paragraph indicates that India is unlikely meet its MDGs 4 & 5. As to why so, the reader has to somehow figure it out by reading the next paragraph. Lot of background research presented but not clearly linked with their implications for this study. • The two terms 'Coverage' and 'coverage gap' are used in this section. However only 'coverage' is defined, and 'coverage gap' is not. Why the paper does chose to measure coverage gap instead of coverage? • The AHSs already monitors the district-level differentials in intervention coverage and health outcomes. Why is it also important to look at district-level differentials in CGI presented in this paper? • The background section indicates that socio-economic status is associated poor access to health services and health outcomes. This study demonstrates the same using a different set of measurements. The paper needs to discuss why it was required. • I was unable to pinpoint the explanations in the introduction on why the analysis presented in this paper was required. <p>Few burning issues in the methods:-</p> <ul style="list-style-type: none"> • The CGI index measurement formula shows that one indicator was used for family planning, yet Table 1 presents two family planning indicators? • Sample sizes of each of the data sets used for this study? • Table 4 presents data according to wealth quintile which is not defined in the methods. • Major concern is the missing description on how the two data sources were linked.
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VERSION 1 – AUTHOR RESPONSE

Reviewer #1:

Comment 1: This article is motivated by availability of a new set of information at district level for the high focus states of India. It is a good attempt at utilizing this information set towards gauging disparities in MCH services and associating such disparities with disparities in socioeconomic development. While an exercise of this kind has a scope of offering an understanding of the regional dynamics of disparity in MCH outcomes, it needs to have the required rigour in the analysis and backed by a sound premise of literature.

Response 1: The manuscript has been substantially modified incorporating above suggestions. Relevant references are also provided.

Comment 2: This exercise sounds like to building a connection between two disassociated pillars. First of all the two indexes proposed are computed on two different principles and therefore cannot be contrasted against each other. The first index is based on the attainment criterion and the second on comparative criterion.

Response 2: The linkage between: Wealth Index and Coverage Gap Index (CGI) has been studied in past, relationship between socioeconomic status and health services utilization is well established. Countdown 2008 Equity Analysis Group has proposed the concept of CGI for maternal and child health services and established its relationship with wealth index and infant mortality (Lancet 2008; 371: 1259–67). In the present study linkage between Socioeconomic Development Index (SEDI) and

CGI are explored, assuming that wealth index represents the socioeconomic status of household while SEDI represents almost similar domain with different set of variables for region e.g. district. Relationship between socioeconomic status and health services utilization is well established. Countdown 2008 Equity Analysis Group has proposed the concept of CGI for maternal and child health services and established its relationship with wealth index and infant mortality.

Comment 3: As regard associating two dimensions, distributional analysis becomes ideal to infer the strength and dynamics of such association. A simplistic index of socio economic development with a set of arbitrarily chosen indicators makes any inference based on it to be less robust. It is necessary to justify these set of indicators and their relevance with MCH care.

Response 3: The distributional analysis is also carried out and presented in 'Table 4'. Socioeconomic development index (SEDI) was constructed using five variables as: female literacy rate, urbanization percent, main workforce, safe drinking water and electricity as source of lightning. All the variables used for SEDI are considered by several authors Gokhale et al. (J Health Popul Nutr 2002) and McTavish et al. (Social Science & Medicine 2010), Desai S and Alva S (Demography 1998) Becker et al (Health Transition Review 1993) Desai S et al (IHDS Working Paper 2006). Therefore, it was assumed that the variables used to construct SEDI are the important and reflects overall socioeconomic development.

Comment 4: The analysis is based on application of correlation and regression methods which is perhaps not adequate to conclude anything significant and for that matter it has not facilitated any unique observation at the end. The conclusion of the paper sounds trivial and merits no attention.

Response 4: As suggested earlier in comment 1 distributional analysis is given in table 4 of the manuscript. Conclusion of the manuscript is rewritten. Sensitivity analysis is also performed to strengthen the findings of the study.

Reviewer #2:

Comment 1: The aim of the study is to examine the variation in coverage rates of a key set of interventions of maternal and child health services..... However, authors have not provided any detail/contents of these interventions.

Response 1: The details of interventions are provided in the manuscript (page 8), the details are published in other studies also (Nyamtema et al 2011).

Comment 2: It is said that the data has been analyzed in the districts of High focus states of India, however, there is no mention as what is meant by High Focus states and how it differs from other states.

Response 2: Definition of 'high focus states' is given in the material and methods section of revised manuscript (page 7 line 6-11).

Reviewer #3:

Comment 1: The write up of the paper is very poor, and a major part of the analysis is unclear. CGI and SEDI were measured from two different data sources (the former from AHS and the latter from census). As such, to conduct a correlation between the two measurements one had to link the AHS respondents with their data from the census. Given the sample sizes in Table 3, it is unlikely that individual level data from the AHS were linked with individual level data from the census (in which case the sample sizes in Table 3 would have been much larger). The most plausible explanation is that the CGI and SEDI measures were an aggregate at a higher level (e.g., enumeration area or village) and then linked with each other to seek the correlations. Nevertheless, these explanations were not given in the paper.

Response 1: Manuscript is rewritten and write up has been improved. CGI and SEDI are measured at district level (not individual level) and are linked according to district for correlation study; this has been mentioned in the methods section of the manuscript.

Comment 2: Assuming that correlations presented between CGI and SEDI in the paper were at the community level (village or enumeration unit) it should be noted that interpretation of the individual level and community level correlations are not exactly the same. The paper is presented as if the correlations were sought at the individual level.

Response 2: Interpretation of correlation has been made for districts (unit of analysis) and presented at page 10 of revised manuscript.

Comment 3: The authors use the terms 'CGI', 'SEDI', 'high focus states in India' etc. as if the readers should know what they are. The methods section does not give any idea how the 'CGI' and 'SEDI' were measured.

Response 3: Added in the methods section of manuscript (page 8-9).

Comment 4: The word 'linkage' is not an appropriate term to indicate 'association' or 'correlation' (page 2, line 41).

Response 4: The word linkage is replaced with association at page 2.

Comment 5: After reading the main text I am not convinced that CGI and SEDI are measurements of disparity. What I understood CGI is another way of defining coverage (i.e., 100 minus actual coverage in percentage points) while SEDI is used to classify individuals according to their socioeconomic status. Thus disparity measures would be differentials in CGI by another factor (for example, by urban rural, or by district, or by SEDI etc.).

Response 5: In present study an attempt is made to study disparity in CGI by SEDI, changes made in the manuscript wherever applicable.

Comments 5: Cronbach's alpha was used test the reliability (page 2, line 41). ... reliability of what?

Response 5: Cronbach's α reliability coefficients were calculated to ascertain the internal consistency of the items when used to construct the different indexes. This has been modified in the manuscript.

Comments 6: Is Cronbach's alpha a 'test'? The term 'test' usually means testing a hypothesis. Assessment is a better word here.

Response 6: Authors are thankful to reviewer for identifying this error; necessary changes are made in the manuscript.

Comments 7: Observing trend was part of the objective indicated in the abstract; however the results section of the abstract does not reflect it.

Response 7: Results of trend analysis are also added in the result section of abstract.

Comments 8: The regression findings presented in the last sentence of the results section of the abstract could not be found in the main text. Why is beta positive for a negative association?

Response 8: It was a typing error, regression coefficient for SEDI is actually negative and same is modified in the results of abstract.

Comments 9: First sentence of Introduction is incomplete.

Response 9: Sentence is rewritten

Comments 10: Disjunction between statements of conclusions and data presented. For example, the second last sentence of the first paragraph indicates that India is unlikely meet its MDGs 4 & 5. As to why so, the reader has to somehow figure it out by reading the next paragraph. Lot of background research presented but not clearly linked with their implications for this study.

Response 10: Introduction has been modified accordingly

Comments 11: The two terms 'Coverage' and 'coverage gap' are used in this section. However only 'coverage' is defined, and 'coverage gap' is not. Why the paper does chose to measure coverage gap instead of coverage?

Response 11: Definition of coverage gap is added in the method section. Rational behind using coverage gap is that it gives idea what is left to achieve.

Comments 12: The AHSs already monitors the district level differentials in intervention coverage and health outcomes. Why is it also important to look at district level differentials in CGI presented in this paper?

Response 12: It is true that AHS monitors district level differentials for each intervention coverage and health outcome. But for policy implication an overall composite index will be more useful. This study is an attempt to fill this gap.

Comments 13: The background section indicates that socioeconomic status is associated poor access to health services and health outcomes. This study demonstrates the same using a different set of measurements. The paper needs to discuss why it was required.

Response13: Justification for using SEDI is added in material and method section page 9 of manuscript.

Comments 14: I was unable to pinpoint the explanations in the introduction on why the analysis presented in this paper was required.

Response 14: As discussed in the manuscript 9 high focus states cover approximately 50% population of India. These states have high mortality and fertility rates. As discussed by Ram U et al. 2013 that only 3.8% districts of these states were on track to achieve MDG, thus it is important to check variation in coverage rates of a key set of interventions of maternal and child health services in these districts and its relationship with socioeconomic development.

Comments 15: The CGI index measurement formula shows that one indicator was used for family planning, yet Table 1 presents two family planning indicators?

Response 15: Thanks for pointing out this error, table 1 is modified.

Comments 16: Sample sizes of each of the data sets used for this study?

Response 16: Since this is a district level analysis, sample size of the study was 284 districts as mentioned in the table no 3

Comments 17: Table 4 presents data according to wealth quintile which is not defined in the methods.

Response 17: Added in methods page 10 line 5-7.

Comments 18: Major concern is the missing description on how the two data sources were linked.

Response 18: Since the present study uses district level data from AHS and Census sources, so there was no problem in linking data for particular district from various sources. Several studies have also used the same methodology for district level analysis (Lancet Glob Health 2013;1: e219–26)

VERSION 2 – REVIEW

REVIEWER	Dr Vinod K Srivastava Hind Institute of Medical Sciences, Barabanki, UP, India
REVIEW RETURNED	02-Mar-2016

GENERAL COMMENTS	The present article is the revised version of the article submitted earlier. The article has been revised as per earlier comments.
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REVIEWER	Joseph Mathew PGIMER Chandigarh
REVIEW RETURNED	20-May-2016

GENERAL COMMENTS	<ol style="list-style-type: none"> 1. Please confirm if the Coverage Gap Index is a validated score. 2. This study assumes that the failure of the local population to utilize the 4 services covered in the CGI, are related to inappropriate coverage (i.e the services were available and accessible, but the people did not utilize them). Please confirm whether CGI accounts for issues connected to lack of availability and/or access to these services in the districts of interest. 3. The CGI place equal weightage for each of the four “broad
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	<p>services” , whereas in real life these may not be treated in the same way by the community. For example, people may be comfortable with ORT for diarrhea, but not with ARI management. This should be highlighted.</p> <p>4. Similarly, the BCG vaccine dose is treated with equal weightage to measles vaccine dose in the CGI, whereas data does not support this. National level data suggest that the coverage rate drops from BCG (80-90%) to measles (40%), suggesting that the community start vaccinating, but drop off with time. This point also needs highlighting.</p> <p>5. It is unclear why three doses of DPT are given twice the weightage as BCG or measles.</p> <p>6. Please confirm if SEDI has been previously validated, and if yes, against what?</p> <p>7. Please comment whether the district population density could be an independent variable affecting both CGI and SEDI. If yes, then could the correlation be just a function of population density?</p> <p>8. In Conclusion, please confirm whether this data analysis adds anything new to the facts that are already known.</p>
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VERSION 2 – AUTHOR RESPONS

Reviewer #4

Comment 1: Please confirm if the Coverage Gap Index is a validated score.

Response: The CGI is a well established score the reference is already made on page 7-8 on manuscript and mentioned in bibliography (12, 18-20). However this index has been used by WHO and some other authors like (Barros, Ronsmans et al. 2012, Kumar, Singh et al. 2012, Barros and Victora (2013), Kumar, Singh et al. 2013) and these are incorporated in manuscript and bibliography at appropriate place.

Comment 2: This study assumes that the failure of the local population to utilize the 4 services covered in the CGI, are related to inappropriate coverage (i.e the services were available and accessible, but the people did not utilize them). Please confirm whether CGI accounts for issues connected to lack of availability and/or access to these services in the districts of interest.

Response: As per definition the CGI reports the gap between the maximum coverage (100% coverage based on availability as well as accessibility) and the coverage achieved under community settings. It does not address issue of availability and accessibility in isolation, perhaps it is an issue related to process. Accordingly the changes made on page 8 and paragraph 1.

Comment 3: The CGI place equal weightage for each of the four “broad services”, whereas in real life these may not be treated in the same way by the community. For example, people may be comfortable with ORT for diarrhea, but not with ARI management. This should be highlighted.

Response: This is a valid point raised by the reviewer. We also feel that equal weightage for all broad services may not be logical and the same has been mentioned in the limitation of the study at page 4.

Comment 4: Similarly, the BCG vaccine dose is treated with equal weightage to measles vaccine dose in the CGI, whereas data does not support this. National level data suggest that the coverage rate drops from BCG (80-90%) to measles (40%), suggesting that the community start vaccinating, but drop off with time. This point also needs highlighting.

Response: Response added as per response 3

Comment 5: It is unclear why three doses of DPT are given twice the weightage as BCG or measles.

Response: DPT coverage involves multiple contact with the health services and also highly correlates with other vaccination like poliomyelitis and Haemophilus influenzae B Boerma, Bryce et al. (2008). Therefore this has been considered more important and has been assigned a weight of two.

Comment 6: Please confirm if SEDI has been previously validated, and if yes, against what?

Response: Normally for the defining socioeconomic indicator wealth index is used if the unit of study is individual or family. But in the present analysis the unit of study is a geographical region (district) therefore an alternative index SEDI was used, to describe the socioeconomic situation in these regions. The variables used in SEDI are suggested by several authors and same set of variables are used in the present analysis. However the application of SEDI is not very common but has been used by Yadav and Bhagat (2011). These references are already mentioned in appropriate places and given in bibliography at 24-28.

Comment 7: Please comment whether the district population density could be an independent variable affecting both CGI and SEDI. If yes, then could the correlation be just a function of population density?

Response: We investigated the relationship between CGI and find a weak correlation and the same is supported by Kumar, Singh et al. (2012)

Comment 8: In Conclusion, please confirm whether this data analysis adds anything new to the facts that are already known.

Response: The study adds new information on utilization of four key health services in a more realistic and simple way and may be useful program monitoring and healthcare planning. The fact has been included in the conclusion section at page 20 paragraph 1.

VERSION 3 – REVIEW

REVIEWER	Joseph Mathew PGIMER Chandigarh India
REVIEW RETURNED	30-Jun-2016

GENERAL COMMENTS	I am still not fully satisfied with the issues (and responses) raised in Points 1, 2, 4, 5, 7 and 8 of the previous review. However, in view of the hard work put in by the authors, the manuscript is recommended to be accepted.
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