**Date: 15-11- 2017**

**To**

**The Editor,**

The Indian Journal of Medical Ethics

**Sub**: Original Article for considering publication

Title “Limitations and performances of Ethics committees in evaluating reproductive health research on human subjects.”

Dear Sir,

Here with I attach the Original Article prepared from the study conducted by me as the Principal Investigator and Co-author as Co- investigator. The co-author’s signature attached and confirms that she had sufficiently participated in the work and has approved the manuscript.

The submission is not under consideration for publication in any other journal.

Consent given to Dr. Sowmini C V. to act as the author for correspondence.

Details of financial support and no competing interest attached.

We have read the terms and conditions of authorship of IJME and accept them.

Contact details and affiliation of all authors attached.

Kindly consider this article for publication in your esteemed Journal.

Thanking you

Sincerely

Dr. Sowmini CV,MBBS,MPH,PGDAP, Masters BioEthics(EMMB)

Scientist B, ICMR-NIRRH-FU,

Dept.Obste& Gynec,

Medical College,

Trivandrum

**Title of the article;**

“Limitations and performances of Ethics committees in evaluating reproductive health research on human subjects.”

**Names -** *Sowmini CV1, Nirmala C2*

**Affiliations**- 1. Scientist B, ICMR-NIRRH-FU/ SATH/Dept.of Ob&Gy/ Medical College, Trivandrum

2. Prof. & HOD/ SATH/ Dept.of Ob&Gy/ Medical College, Trivandrum

**Mailing addresses -**

1. Scientist B, ICMR-NIRRH-FU/ SATH/Dept.of Ob&Gy/ Medical College, Trivandrum

2. Prof. & HOD/ SATH/ Dept.of Ob&Gy/ Medical College, Trivandrum

**Telephone numbers and** email addresses

**1-9495627956, sowminicv@gmail..com 2. 9447047886, nirmalactvm@gmail.com**

Signatures of **all** authors;

1. Sowmini CV1
2. Nirmala C2

To **track correspondence** - Sowmini C V Performances of Ethics committees

**Name of the designated corresponding author** and statement of authorship

**Sowmini CV**,

Scientist B, ICMR-NIRRH-FU/ SATH/Dept.of Ob&Gy/ Medical College, Trivandrum

statement of authorship

**Title of the article;**

“Limitations and performances of Ethics committees in evaluating reproductive health research on human subjects.”

**Names -** *Sowmini CV1, Nirmala C2*

**Affiliations**- 1. Scientist B, ICMR-NIRRH-FU/ SATH/Dept.of Ob&Gy/ Medical College, Trivandrum

2. Prof. & HOD/ SATH/ Dept.of Ob&Gy/ Medical College, Trivandrum

**Mailing addresses -**

1. Scientist B, ICMR-NIRRH-FU/ SATH/Dept.of Ob&Gy/ Medical College, Trivandrum

2. Prof. & HOD/ SATH/ Dept.of Ob&Gy/ Medical College, Trivandrum

**Telephone numbers and** email addresses

**1-9495627956, sowminicv@gmail..com 2. 9447047886, nirmalactvm@gmail.com**

A statement of competing interests and funding support.

We report that there is no conflict of Interest in this study

The study was funded by ICMR and we are thankful to ICMR for the financial support.

**Acknowledgements**

We are extremely grateful to Dr. Malabika Roy, Former Head Division of RHN,ICMR, for all the untiring and timely guidance all throughout our project.

We are deeply indebted to ICMR for the financial assistance and Institutional Ethics Committees respondents provided the data without which we will not be able to complete this project.

We wish to place on record our gratitude to Dr. Ramdas Pisharody, The former Head of our Institution for the professional expertise and for all assistance offered and to the staffs of various medical Institutions/HRRC staff who helped us in getting to IECs.

Corresponding Author1

Sowmini CV1  Scientist B, ICMR/ NIRRH-FU, SATH, Dept.O&G, Medical College, Trivandrum.

Nirmala C2, Prof&HOD, SATH, Dept.O&G, Medical College, Trivandrum.

**ABSTRACT**

**Limitations and performances of Ethics committees in evaluating reproductive health research on human subjects.**

*Sowmini CV1, Nirmala C2,*

**Introduction**

Considering the potential risk related to participants in medical research a competent Ethics committee plays a crucial role in regulating medical research. Considering this greater responsibility of the Ethics Committees towards science and medicine, this study is proposed to review the work of Institutional Ethics Committees (IEC) in India

**Objectives**

To study

1. The characteristics
2. Performances
3. Constraints of Ethics Committees.

**Methodology**

A cross sectional survey of IECs in India were done to collect information on 1) characteristics 2) Performance 3) Constraints of ethics committees. The total sample was 30 IECs including 10 IECs which were visited to validate and strengthen the data.

**Result**

The studied 30 IECs were functioning in the concerned institution between 10- 30 years. From 20 IEC information was given by the member secretary. The total number of IEC members ranged from 9-17. In 20 IEC the chairpersons were from outside institute. The committee had an average 1-9 institutional and 3-12 outside members. Only 10 IEC get support from subcommittees like TAC. In 13 IECs meeting conducted bimonthly and 18 IECs intimate the members 2 weeks prior to meeting. Members get protocol 1 week prior to meeting. 24 IECs have >50% of the members as requisite for quorum and in last 6 months no meeting conducted with < than quorum.

On an average IEC gets 20 proposals for a single sitting.

The number of copies of protocols need to be submitted ranged from 1- 17. The IEC outcome of the ethical review intimated to researcher with in week (20 IEC) and most communication are done by hand (19). The feedback by the investigator to the IEC and site visit by IEC were very irregular.

IECs mentioned the need for formal training on regular basis. Record keeping was good and few committees have computerized system. 19 IECs said they pay honorarium to IEC members ranging from Rs. 500-1000. 20 IEC reported they collect fee from investigator and wide variation in fee structure. All most all IEC was not having any staff /post designated for IEC activity alone.

**Conclusion**

The help of TAC/Methodology/Protocol committee can improve IEC functioning.

Online or by email submission will be good option for space constrains

The feedback on study progress and AE reporting by investigator and IEC members visiting the investigator site to IEC needs to be strengthened.

No formal regular training, no uniformity in fee structure, no post designated to IEC needs consideration.

**Limitations and performances of Ethics committees in evaluating reproductive health research on human subjects.**

*Sowmini CV1, Nirmala C2*

**Introduction**

Medical researches contribute directly and significantly to the advancement of medicine by unveiling the grey area in medicine and thereby indirectly impacting the rapid social progress of the humanity and the exponential growth in knowledge. Despite its unsurpassable role in medical development, clinical research should be full-proof as far as the safety and well being of the research participants1,2 are concerned. A sound practice of ethics in medicine is mandatory considering the potential risk related to research. Competent Ethics committees3,4 with standard functional modalities5 play a crucial role in regulating medical research.

In India ICMR has developed guidelines for research involving Human subjects and further these guidelines are revised and updated periodically. According to this guideline, all research involving human subjects should be approved by the Institutional Ethics Committee / Institutional Review Board6,7. For a committee to be competent it should have right composition of competent members, with strict adherence to standard guidelines8 and importantly to be free of constraints,9,10. Considering this greater responsibility of the ethics committees towards science and medicine, there is a need to look into characteristics, performance, and constraints 11 of ethics committees which evaluate research on human subjects. Thus this study is proposed to look into the work of Institutional ethics committees in India

**Objective**

This study will observe

1. The characteristics
2. The Performances
3. Constraints of ethics committees in India.

**Methodology**

**Sample size/population/variables**

This study was done as a cross sectional survey of 30 Institutional Ethics Committees (IEC) on Human Research, that examine and approve medical researches in India. Structured questionnaire and interview schedule were used to collect details and the tools were modified after discussion with expert in the field and pre tested before the start of data collection.

Suitable variables were chosen to address 3 major objectives of the study like A) Characteristics B) Performance C) Constraints/ limitations of IEC

**Study procedure/ Data collection**

From the Medical Council of India web site list of various Medical Institutions were retrieved. From this list 140 IEC were identified and were able to contact few committees that have e mail id or telephone number were. Projects explained before sending the questionnaire.

The study was carried out in two phases.

In the 1st phase, Consent form, an introductory note was obtained from the Head of the institution and Head of Department to approach the IECs were send with questionnaire and self addressed envelope to these 140 IECs to collect information on study variables. . Confidentiality and privacy were assured to the committees before data collection**.**

During 2nd phase, 10 IECs were visited to attain adequate sample and to validate and strengthen the data. Structured interview schedule used for data collection .

Study was completed in 2years. We could collect data from 30 IECs.

**Result**

**General Information on studied IEC**

**1) Respondents from IEC who gave information.**

In 20 IECs, the details of the committees were provided by member secretary. In 4 committees the chair person gave the information and from 6 committees a member of IEC.

**2) No of years the respondent associated with IEC/institute**

In 16 committees the respondent were associated with any IEC were 5-10 yrs. In 8 IEC <5yrs. Another 4 committees 10-15yrs.

**3) No of years the IEC functioning in the Institute.**

All studied committees were functioning in Institution for more than 5 years. Ten committees were functioning for 10-15yrs another 8 committees were functioning between 15-20yrs. Some 3 committees were as old as more than 20yrs and among that one committee in that Institution was functioning for more than 30yrs. Seven committees were between 5-10yrs old.

**Section A.**

**Characteristics of Institutional Ethics Committee**

**1) Number of members in IEC.**

The total number of IEC members ranged from 9-17. The committee had an average 1-9 institutional and 3-12 outside members (3-12).

**2) The chairperson of IEC:**

Twenty committees had chairperson from outside institution, six committees had chairperson from own institute of IEC, 4 committees did not responded to this question.

**3) Selection of members**

28 Committees said they follow ICMR guidelines/ schedule Y for selection of IEC members. 2 committees did not responded. For information on how members are nominated majority of the committee said the members are nominated by College Council or the Dean/Principal of the institution. The criteria mentioned by few committees regarding selection of members is based on their Biodata, Publications in indexed journal, their interest in research, research experience, academic qualification, interest and willingness and experience as scientific reviewer etc.

**4) Co opt for expert/members as and when required.**

Whether they co opt for any expert/ members as and when required – 28 committees responded as “yes”. 2 committees said “No”. For some projects when the concerned specialty expert is not there in the committee, co opt for expert from the field of that particular specialty.

**5) Any sub committees to support IEC**

Committees were enquired whether IEC get support from sub committees. 10 committees responded “yes”. Some IEC are having as high as three of such sub committees to support the IEC. These committees were named differently in different institutions. The referred names to such committees in various institutions are Data safety committee, Clinical Trial Committee, PG Thesis review committee, Public health committee, Clinical study committee, Technical Advisory Committee, Protocol Committee etc. These committees mainly look into various methodological issues and other issues apart from ethical issues. So that the IECs have to focus on ethical issues related to the project.

During interview with few committees, many committee expressed their plan to form sub committees to support the IEC. Thus they can reduce the burden/work load on IEC. Some were in the process of making such committees. This movement was seen in major institutions like medical colleges where they have many post graduate students and faculties involved with researches of various kinds. They were mentioning that during the PG thesis submission time each year their work load is so high that they find it difficult to do the whole process.

The role of sub committees is that they rarely rejects projects but advice on revision and resubmission as and when required. The main reason for rejection are major methodological issues. IEC that is having sub committees, it is mandatory to get clearance from sub committees for IEC to consider the project protocol.

**Section B**

**Performances of IEC**

**1) Schedule of meeting**

The IEC were asked about how frequently they convene the meeting routinely and how many meetings were conducted during the last 6 months. Meetings were ranged between 0-8 meetings in 6 last month. Majority were conducting bimonthly meeting (13REC). 9 conducting monthly . 3 committees once in 3 months and 4 committees 6 monthly. One committee reported only one meeting during the last year.

**2) Members notified about meeting**

Majority (18committees) were intimating about the next meeting 2 weeks prior to the scheduled meet and 4 said 1 week prior. 6 committees 1 month and 2 committees 2 months in advance.

**3) Members getting the study protocol**

13 committees said the study protocols are made available to the members 1 week prior and 11 committee said it will reach 2 weeks prior and 6 committee’s 1 month earlier to scheduled meeting.

**4) Discussion before the meeting**

Any discussion related to the project proposals prior to official meeting were queried. Thirteen IEC said some members do discuss before meeting if they are not clear about the projects details. Another 17 REC said “no”. All issues and doubts were discussed during the meeting.

**5) Quorum to convene meetings**

Whether the committee insist on minimum number of members for an official meeting and the requisite quorum is maintained to officiate meeting were asked. All the committees said they always maintain minimum quorum for all meeting.

**6) Minimum number of IEC members for quorum.**

In the questionnaire the IEC was requested to mention the minimum number of members required for quorum and the total number of members of their IEC. The minimum number required reported by 30 studied IEC ranged from 5 -12.

24 committees reported the minimum requirement >50% of their total IEC members. Two committees said minimum number required is 2/3 rd of the IEC members. 4 committees reported <50% of the total members of their committee as the required number.

Few committees even specifically mentioned the quorum as 50% of their total IEC members + 1 additional member. For eg. one IEC was having a total of 14 members and the minimum quorum for that IEC was 7+1 ie. 8 members. Another committee said as 2/3rd of the member +one additional member. The committees further mentioned that, in the criteria of minimum quorum it is mandatory to have one legal expert and one non scientific member.

The committees were enquired whether they have conducted any meeting during the last 6 month with less than the minimum quorum and all 30commitees said they have not made any meeting without minimum quorum.

**7) Reason for non attendance of members in IEC .**

The various reasons for members not able to attend meeting were enquired. Majority said prior commitment and many said other urgent matters and due to personal reasons also some not able to attend meeting. Few mentioned out of station and ill health. Majority of the committees said members will intimate their non- availability to particular meeting in writing to the member secretary of the committee. Most committees said frequent non attendees will not be further considered as a member of the committee.

**8) Regarding Project Proposals**

**a) Number of proposals the IEC get for one sitting.**

Committees mentioned a wide range in number of proposals they receive at different point of time. During Post Graduate (PG) thesis submission time they get so many proposals. Some IEC mentioning as low as 1-3 and some other committees reporting as high as > 100 proposals at some point of time. On an average 10 committees said they will get between 3-12 proposals another 9committees reported between 20-50 proposals and 9 committees reported more than 50 proposals including some even reported above 100, another 2commiittees reported as low as 1-3 proposals/sitting.

**b) Number of proposals discussed per meeting**

The number discussed in a single meeting ranged between 3-20 proposals / sitting. Some committees were getting only 3-5 proposals so all are discussed.

**c) Type of proposals**

The types of projects mentioned by various IEC were clinical trials, drug trials (new & old) , field projects, ICMR student project, ICMR studies, DST studies, UG/PG/PhD dissertations, faculty research, self-initiated projects, drug company sponsored projects, experimental projects, observational studies, demographic studies, intervention studies etc.

**d) No. of copies of the protocol the investigator needs to submit to IEC for review**

The copies need to be submitted ranged from 1-17 copies. More than 10 hard copies were the requirement for 24 committees. 5 committees required between 3-5 copies. Two committees said as one hard copy + 1 soft copy and this is circulated to members by email.

**e) Any format for submission**

The committees were asked about whether they insist on any particular format for submission of the protocol. 21 committed said as “ yes” and rest 8 said as “no” and one committee did not responded. Two committees said they have an online submission system for proposal submission.

**f) Proposal discussed in committee with researcher.**

All committee informed they won’t discuss the project with the researchers in committee. 12 committees reported during official meeting if members have doubts the researchers are called to clarify. 18 committees said they officiate the meeting without the researcher. But all the committees reported they call the researcher as and when required.

**g) Rejection of proposals**

The committee reported a range between 5 and 30%14 of the project discussed are rejected for approval in first review and requested revision.

**h) Reason for rejection.**

The various reasons reported for rejection or revision of the proposals by the committees were, major modifications in the project is needed, not fulfilling criteria of submission, faulty methodology, improper submission, logistic problems, drug category B when used for trial, non-essentiality, redoing the research, clinical risk involved, conflict of interest, not upto minimum standard of design, subject selection not appropriate, major ethical issues, consent not adequate, PI having more than 10 ongoing projects.

**9) Conflict of interest :**

All 30 committees said they have not faced any conflict of interest while approving any project so far. Some committee said they will ask the member to report conflict of interest and those members are requested to abstain from IEC discussion of that particular project.

**10) Feedback to the researchers:**

20 committees responded they intimate researcher outcome of committee within 7 days and another 9 committee said in1- 2 weeks’ time14. One committee did not respond.

**11) Channel of communication of outcome to researcher:**

6 Committees reported that committee decision/ certificate is posted to the researcher. 19 IEC reported they will handover the decision directly to research and another 4 IEC reported either by post it or by hand and one IEC did not respond to this question.

**12) Feedback from the researcher:**

19 Committees reported that they will insist the researcher to give feedback to the committee, 9 said they have not insisted a strict feedback. 2 IEC did not respond to this question.

**13) How often researcher give feedback :**

The researchers feed back to IEC was enquired. The response of the IEC were very vague and there is no methodical way of giving feedback to committee. 6 committees said they get 6 monthly progress report of the study and another 2 committee said they will get annual progress report. 2 committee said occasionally they get the response . 2 committee said they get frequently the feedback. Rest of the committees response very vague.

Report regarding the Adverse Event (AE) were also not very methodical by the researcher though the ethics committee insist on AE reporting. There were only few AE report so far with few IEC

**Section C**

**Constraints of the committee**

**1) Adequate training for IEC members**

22 Committees said they get some form of training in research and methodology. This was mainly the members either attend the research methodology workshop conducted by institutes for PG/ UG and faculty and some said they had attended ICMR or other workshop and training conducted. 5 committee said they did not had any formal training in Research Ethics. 3 Committee did not respond to the question. Members mentioned there is a lacuna in systematic and consistent training to members at regular intervals.

**2) Record keeping**

Almost all committees, 29, responded that they have the record keeping system in place for project review by ethics committees and one committee did not responded to the question.

**3) How long the records are archived**

Further the committee were asked how long they keep the records related to IEC review of the projects. There was a wide range of 3-15 yrs of record keeping reported by different committees.

The IEC were given two types of response related to record keeping question in the schedule. Some IEC responded as total duration of record keeping and some other IEC mentioned the number of years they keep the records after the study is over.

11 Committee reported that they keep record for a total period of 10yrs and another 7 IEC reported as they keep over a period of 5yrs which included some IEC responded that as 5yrs after the completion of the trial. 5 IEC said they will keep the records for a period of 3yrs after the completion of the trial. 2 committees each reported as for 6yrs and 15 yrs.

**4) Difficulty in getting chair person**

All 30 committees reported so far they have not faced any problem in getting a chair person to EC. There was no problems in getting members to IEC.

The pattern of committees having the distribution of medical and non medical members in the committees were asked. Number of medical members ranged from 4-11 and non medical members ranged from 3-8 members in various committees.

**5) Payment to IEC members for their services.**

19 committees said they pay honorarium for the members attending the meeting. The remuneration reported ranged between Rs. 500-1000. Few reported the remuneration as that is almost equal to transportation of outside members to attend the place of meeting. Another 10 committee said they won’t pay to IEC members for their services. One committee did not respond to this question

**6) Do the investigator has to pay the IEC.**

The IEC were asked whether they charge any fee from the investigator for Ethical review process. 20 IEC reported that the investigator has to pay IEC fees. Another 10 committee said they won’t charge any fee from the investigator. Those committees that are not presently charging any fees few of them said they believe that the IEC has to be paid for the ethical review process.

**7) Payment structure**

Those committees mentioned about collecting fees from investigators there were three types of payment structure, with different IEC. One is, some committee mentioned they collect uniform sitting fee form all investigators who submit proposal to IEC for review including PG/UG/PhD thesis review. The amount mentioned ranged between Rs.1000- 2000. The second type mentioned by IEC was they charge different fee for in-house projects and for drug trials sponsored by pharmaceutical companies. There was a wide range in the fee structure ranging from Rs. 5000-30000. Few mentioned apart from this fee Rs. 10000 for each amendment in protocol and 35000 for expedited review. Another one mentioned 15000 as IEC sitting fee along with 10% of the total project. Yet another reported Rs 500. Few committee reported its not the IEC but the technical committee that collect the fees. In general there is a wide range in the payment structure when various committees are concerned.

**8) Cost for conducting meeting.**

16 committee said there are no cost involved as they conduct the meeting in the Institute or chair persons chamber. 5 committee reported cost between Rs. 5000- 10000 as the cost per committee meeting. One committee even mentioned the cost as 14500. Another committee said Rs.250 as the cost per meeting and it is for the refreshment of the members. There was a wide range in cost structure in conducting the meeting.

Some IEC mentioned the cost for IEC meeting was met from the fee collected from the investigators. Other IEC’s that are not collecting any fees from the investigators, mentioned the Institutes fund is utilized for the expenditure related to IEC meeting.

**9) Legal expert in the committee**

All 30 committee said there is a legal expert in their IEC.

**10) Availability of IEC specific staff for IEC activity**

Majority of the IEC was not having any specific post designated to IEC activity alone. Very few IEC reported part time employee working for IEC. Most of the work related to IEC were done by staff of parent department under which IEC was functioning. Many of the IEC even reported this as an additional non paid activity.

**11) Site visit by IEC**

The committee were asked whether they visit the study site of the going research. The response of the committee were very vague and 14 said as they would visit if the researcher report AE/ problems but how many site visit done was not responded. Out of this one committee mentioned the Data Safety monitoring committee do the site visit if any problem occurs. 15 said as they have not done site visit to the researchers place of study. One IEC was a non responder to this question.

**12) Adverse Event report**

Regarding Adverse Event reporting from the investigators, 19 committees said they get AE reporting occasionally and 11 said they do not get.

**13) Out side pressure to clear project**

29 committees said they have never faced any outside pressure to clear projects. One committee said as YES but further explanation on what was the nature and context of the pressure not mentioned.

**14) How to fix date**

Majority said the date was fixed by discussion between the chairperson and members. Date convenient to members are chosen. Few others mentioned as per availability of chair person. Some other committee mentioned fixed day in week were considered as the day for meeting like,

1) First Thursday of every month

2) Every third Saturday of alternate month etc…

**Conclusion**

There was a wide range of proposals, from 1-100, received by committees indicating the hefty workload of committees to deal with review process. Nearly 2/3rd of the IEC were not having support from other sub committees. Committees that has to deal with many projects the help of TAC/Methodology/Protocol committee can improve IEC functioning.

Some IECs reported as having online or by email submission which will be good option to consider by other IEC also so that more paper works/space limitations can be circumvented.

The feedback on study progress and AE reporting by investigator to IEC needs to be strengthened. IEC members visiting the investigator site also need to be improved.

Many committees mentioned the need for formal training focused to IEC members on regular basis12.

There is no uniformity in fee structure/amount that the investigator has to pay among the various IECs. The independence and competency of the IEC has to be considered especially with a hefty fee structure.

Majority of the IEC was not having any specific post designated to IEC activity alone. Very few IEC reported part time employee working for IEC. Most of the work related to IEC were done by staff of parent department under which IEC was functioning8,13. Many of the IEC even reported this as an additional non paid activity.

**References**

1. Tindana PO, Singh JA, Tracy CS, et al. Grand challenges in global health: community engagement in research in developing countries. PLoS Med 2007;4:e273 doi:10.1371/journal.pmed.0040273.
2. Molyneux CS, Wassenaar DR, Peshu N, et al. ‘Even if they ask you to stand by a tree all day, you have to do it (laughter) …!’ Community voices on the notion and practice of informed consent for biomedical research in developing countries. Soc Sci Med 2005;61:443–54 [[PubMed](http://www.ncbi.nlm.nih.gov/pubmed/15893058)]
3. Performance of research ethics committees in Spain. A prospective study of 100 applications for clinical trial protocols on medicines.R Dal-Ré, J Espada, and R Ortega, Med Ethics. 1999 June; 25(3): 268–273.
4. ***Ethics*** ***committee***s and health services ***research***. ***Maria Ginzler***,   
   ***Jane Davies***,  ***Klim McPherson***,  ***Nick Black***, Journal of Public Health: Volume 12, Number 3-4; Pp. 190-196
5. Emanuel EJ, Wendler D, Killen J, et al. What makes clinical research in developing countries ethical? The benchmarks of ethical research. J Infect Dis 2004;189:930–7 [[PubMed](http://www.ncbi.nlm.nih.gov/pubmed/14976611)]
6. **Profile and role of the members of ethics committees in hospitals and research organisations in Pune, India** , Radhika Brahme, Sanjay Mehendale, [Indian J Med Ethics.2009 Apr-Jun;6(2)](http://www.issuesinmedicalethics.org/issue172.html)
7. Kumar Nandini. Bioethics activities in India under ICMR. [cited 2007 Jun 25]. Available from: http://icmr.nic.in/bioethics/cc\_biothics/presentations/haryana/activity.pdf
8. Kirigia JM, Wambebe C, Baba-Moussa A. Status of national research bioethics committees in the WHO African region. BMC Med Ethics 2005;6:10–6.)
9. Are research ethics committees behaving unethically? Some suggestions for improving performance and accountability *BMJ* 1996;313:1390-1393 (30 November) Education and debate, **Julian Savulescu**, *Sir Robert Menzies medical scholar*,a **Iain Chalmers**, *director, UK Cochrane Centre*,b **Jennifer Blunt**, *former chair, Salford research ethics committee* c
10. Health Prog. 2006 Mar-Apr;87(2):26-30.A "next generation" ethics committee. St. Joseph Health system has integrated performance-improvement features into its ethics work. Murphy K. Theology and Ethics Department, St Joseph Health System, Orange, CA, USA.
11. Research ethics committee audit: differences between committees Redshaw ME, Harris A, Baum JD. J Med Ethics. 1996 Apr;22(2):78-82.
12. Composition, training needs and independence of ethics review committees across Africa: are the gate-keepers rising to the emerging challenges?A Nyika, W Kilama, R Chilengi, G Tangwa, P Tindana,P Ndebele, and J IkinguraJ Med Ethics. 2009 March; 35(3): 189–193. Published online 2009 February 20. doi: 10.1136/jme.2008.025189.
13. Varmus H, Klausner R, Zerhouni E, et al. Public health. Grand challenges in global health. Science 2003;302:398–9 [[PubMed](http://www.ncbi.nlm.nih.gov/pubmed/14563993)]
14. The activity of French Research Ethics Committees and characteristics of biomedical research protocols involving humans: a retrospective cohort study. Evelyne Decullier, Véronique Lhéritier, and François Chapuis BMC Med Ethics. 2005; 6: 9. Published online 2005 October 17. doi: 10.1186/1472-6939-6-9.