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ISMS BULLETIN

Official Publication of the

Indian Society for Medical Statistics (ISMS)

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Contents

Editorial

Indian Society for Medical Statistics has just completed its thirty years of existence. Consistent efforts by the dedicated office bearers and esteemed members of the Society had been successful not only in establishing the roots of the mission of the Society in India and abroad but also in ensuring the growth of its strengths and developing its horizons as well the domain of academic activities. Five years back during the Silver Jubilee year of the Society three important committees were constituted of which two namely the "ISMS Silver Jubilee Committee" focused on relooking at the constitutional, rules and regulations of the Society and "ISMS Core Committee on Education, Training and Research" had submitted their recommendations. As per the decisions of EC and GB held at Ludhiana conference – 2012, these recommendations are being published in the current issue of the Bulletin to invite valuable comments of the members before they are ready to be posted on the official website of the Society. The third committee was suppose to collect and collate information on various awards to construct and preserve year wise listing; to enrich ISMS archived information on EC and GB minutes from the very inception and to gather information on membership and related academic activities of the Society. We are happy to initiate actions of the third committee at least during the thirtieth year of the Society that too using the platform of ISMS Bulletin and the proposed support from the ISMS new Web-Coordinator and Web-Managers of the newly launched website.

It is proposed to have at least four issues of the Bulletin in a calendar year (Jan-March; Apr-June; Jul-Sept and Oct-Dec). Active participation of the members as well support from the office bearers is anticipated in ensuring the regular flow of academic information on the activities of ISMS in all the regions across the country. The Bulletin of ISMS had been quite regular from its inception in 1986 organized by the able hands of Editors like Prof. T. Krishnan from ISI Calcutta. The first electronic version was published by Prof. R. M. Pandey, AIIMS, New Delhi; and was continued to be published by Prof. Sreekumaran Nair, Manipal University, till last year. I hope with the cooperation and active support of ISMS colleagues we must be successful in achieving or to say at least reassuming the status of the Bulletin of late eighties during the coming years.

Ajit Sahai

30th Annual Conference
Indian Society for Medical Statistics

Minutes of the General Body Meeting Dumra Auditorium, DMCH, Ludhiana

October 7, 2012, 1800 hrs

The President welcomed the members. The following items on the agenda were then taken up for discussion with decisions taken on them as mentioned.

1. Report of the President

The President mentioned that most of the regular activities like deliberations of various committees like Nominations, Awards (including the new committee for Smt. Ramrati Lalima Sahai Award) and FSMS committees were completed in time for this Conference.

2. Report of the General Secretary

The report was presented. The report was approved with the following comments and suggestions of the Executive Council reiterated:

(a) Reports be circulated beforehand by e-mail to all members, at least to EC members or be available when the conference begins;

(b) Action taken and performance reports be included in the report;

(c) Membership numbers be broken down by medical and statistical backgrounds of members;

(d) A membership enrollment desk be set up at conferences;

(e) Attempts be made to initiate joint memberships with International Epidemiological Association and the International Biometric Society;

(f) Members from various regions be nominated for canvassing new memberships from their regions.

3. Report of the Treasurer up to 31 March 2012

The Treasurer presented his report with the Auditors' report. The report was approved with the following comments and suggestions of the Executive Council reiterated:

(a) For each of the awards fund, show accrued interest and expenses incurred during the year;

(b) Explore other avenues for earning (like from conference organizers).

4. Report of the Editor

The Editor's report was presented. The report was approved with the following comments and suggestions of the Executive Council reiterated:

(a) Make attempts to improve and add contents to the Bulletin;

(b) Make attempts to start a journal of the Society.

Some members expressed the view that the

Society should start a journal. Dr C.P. Mishra (BHU, Varanasi) was entrusted with the task of working out details with the help of other members with similar views on the subject, like Professor V.K. Srivastava (VKS had expressed such views in the EC Meeting), prepare a detailed proposal and submit it for discussion.

5. Recommendations of the FSMS Award Committee for the year 2012

The Executive Council on the basis of recommendations by the FSMS Committee had approved the award of the Fellowship of the Indian Society for Medical Statistics (FSMS) to Dr N.K. Tyagi, Belgaum and Dr Abha Rani Aggarwal, New Delhi. The General Body also expressed its approval of the same.

6. Recommendations of the Nominating Committee

The Executive Council on the basis of recommendations by the Nominating Committee (consisting of Dr V.G. Kaliaperumal, Dr K.R. Sundaram, and Dr B.L. Verma) had approved the following nominations for the mentioned vacancies. The General Body also expressed its approval of the same.

President-Elect: 2013-14

Dr. Abhaya Indrayan, Delhi

EC Memberships: 2013-2015

Dr R.M.Pandey, New Delhi

Dr. N. K. Tyagi , Belgaum

Dr. Dilip Chandra Nath, Guwahati

Editorship: 2013-17

Prof. Ajit Sahai, Pondicherry

7. Recommendations of the Awards Committee

The Executive Council on the basis of recommendations by the Awards Committee (consisting of Professor P.P. Talwar - Chairman, Professor C.M. Pandey, Professor R.M. Pandey, Dr. P. Venkatesan, Professor K. Thennarasu) had approved the following nominations for the mentioned awards. The General Body also expressed its approval of the same.

Professor S.K. Bhattacharya Oration Award - 2012: Professor B.L. Verma

Professor B.G. Prasad Award: NONE

Smt. Suraj Kali Jain Award: NONE

Professor P.V. Sukhatme Award: NONE

Indrayan Travel Grant: NONE

Professor R N Srivastava Award:

A special Session for Prof R N Srivastava Award took place during the Conference on the day next to the GB Meeting (i.e., on 8 October). The only paper presented for the Award, that by Mr. Basavarajaiah, was not found suitable for the Award by a Committee of 3 judges - consisting of Prof T. Krishnan, Professor P.P. Talwar, and Professor Nagdeo (of IIPS). Hence, Prof R N Srivastava Award was not recommended to anyone in 2012.

8. Recommendations of Smt. Ramrati Lalima Sahai Award Committee

The Executive Council on the basis of recommendations by the Committee (same as the FSMS Committee) had approved the name of

Professor P.P.Talwar for the Smt. Ramrati Lalima Sahai Award for the year 2012. The General Body also expressed its approval of the same.

9. Proposal for Venue of the 31st Annual Conference of ISMS in 2013

The only proposal from the Christian Medical College, Vellore (Tamil Nadu), which was approved by the EC, was accepted by the GB.

10. Electronic Communication

The General Body endorsed the decision of the EC that all communications between members, office-bearers, and committee members be made electronically as far as possible and printing documents and postal and courier communications be avoided as far as possible. Rules regarding this may be changed wherever needed.

11. Indrayan Travel Grant

Since for the last two years, there have been no applications for this Grant, it was suggested that in such a situation, a committee of President, President-Elect, and Past-President make an offer of the grant to a suitable retired person, at its discretion. This was one of the suggestions made by the EC. This was approved by the GB.

12. Rakesh Shukla Travel Grant proposal

Professor Rakesh Shukla has donated Rs 1,00,000/- for instituting a travel grant. The GB reiterated the EC's decision that Professor Shukla should be asked to submit a detailed proposal to be considered in the next meeting of the Society.

13. Preparation of List of Awardees and Office-bearers since Inception

Although this suggestion was made in the last EC and GB meetings, there has been no progress in this work. It was suggested like in the EC that the General Secretary initiates this work by preparing a proforma, listing all awards (with years), all office-bearers' positions (with years), fill it as far as possible, and send it across to Dr B.L. Verma, Dr P. Venkatesan, Dr Ajit Sahai and others, requesting them to fill the gaps as far as they could, thereby making an attempt to prepare a complete list.

14. ISMS Website and Membership Directory

It was reiterated that (a) the ISMS website is not functioning; and (b) the membership directory is incomplete and needs updation. Professor L. Jeyaseelan of the Christian Medical College, Vellore (Tamil Nadu), offered to host the website in their College and give programming support. However, maintenance work/updation has to be done by the Secretariat. It was also emphasized that for the construction of a new website, full background text materials have to be prepared afresh. For this, the Secretariat may take the help of some knowledgeable members. Further, members wanted to see the new website functional in the coming 2-4 months and desired the Secretariat to take steps, on priority, for this purpose.

The General Body approved the above and welcomed the kind gesture of CMC, Vellore.

15. Rules and Procedures for Smt. Ramrati Lalima Sahai Award

Many members in EC had opined that

(a) The 10-member FSMS committee was not a suitable committee for this purpose; the President was asked to appoint a separate 5-member committee for this Award for future years.

(b) CV's of nominees need not be asked for this purpose; it is enough to get a brief statement from the proposers, of the nominees' contribution to the Society and his/her scientific contributions; his/her consent may also be sought with the proposal.

The General Body reiterated EC's approval of these suggestions.

The President later formed a 5–member committee (consisting of: Dr. T. Krishnan (Chairman), Dr V.K. Srivastava, Dr A. Indrayan, Dr D.K. Subbakrishna, Dr G.D. Shukla) for evaluation of entries of Smt Ramrati Lalima Sahai Award for future years.

16. Smt. Ramrati Lalima Sahai Award for the years 2008, 2009, 2010 and 2011

The EC had recommended that for the past four years (2008, 2009, 2010, 2011), the President may form a 5-member committee, and make recommendations for the awards to the General Body meeting, to be held on Sunday, 07 October 2012. In accordance with this recommendation, the President appointed a committee (consisting of Dr T. Krishnan (Chairman), Professor P.P. Talwar, Dr D.K. Subbakrishna, Dr K.R. Sundaram, Dr R.M. Pandey) which recommended the following names for the awards for the above four years:

2008: Professor P.S.S. Sundar Rao;

2009: Dr S. Radhakrishna;

2010: Professor B.L.Verma;

2011: Dr G.D. Shukla

These suggestions were approved by the General Body.

17. Proposal for KR Sundaram Award

The daughters of Professor K.R. Sundaram have proposed an award in the name of Professor Sundaram. The EC recommended that a committee consisting of Professor T. Krishnan, Professor D.K. Subbakrishna, and Dr Anil Mathew examine this proposal, make suitable modifications, if needed, on the basis of discussions in the EC and GB, and submit it to the next EC meeting for consideration.

18. Reports of Education, Research, Training, Silver Jubilee, and Silver Jubilee Bulletin Committees

The President was asked to upload these reports on the Society website to circulate these reports widely; collect views on the recommendations made and get back to the EC and GB with points for action.

19. Vote of Thanks to Outgoing Office-bearers

The GB expressed its appreciation of the work done by the following outgoing office-bearers and thanked them for their contributions to the Society;

R.J. Yadav
(General Secretary)

T. Krishnan
(President)

23 October 2012

Appeal 1

Esteemed members of the Society and the Office bearers are requested to send Original Articles; Technical Reports, Review Articles; ISMS Academic News items such as Workshops / Seminars Conducted in recent past or plan to be organized during 2014–15.

Also the personal academic achievements by the members, membership activity and messages including useful information to be shared with other members may be please forward to the official e-Mail address of ISMS bulletin at the earliest to enable us to include the same in the next issue of the bulletin.

e-Mail: ismsbulletin2013@gmail.com

Report on Thirtieth ISMS Conference at Ludhiana – 2012

The 30th Annual National Conference of Indian Society for Medical Statistics (ISMSCON2012) was organized at Dayanand Medical College and Hospital, Ludhiana, Punjab from 6-8 Oct, 2012. The theme of the conference was ***Understanding and Translating Statistical and Epidemiological Innovations into Biomedical Research***. In this conference more 450 delegates participated. Beside participants from Iraq and Nepal, the participants from India included from Different Universities, Medical Colleges, ICMR HQ and its Institutes, Dental Colleges, Nursing Colleges and other research organizations located in Andhra Pradesh, Assam, Bihar, Jammu & Kashmir, Himachal, Haryana, Kerala, Karnataka, Sikkim, Maharashtra, Meghalaya, UP, Tamil Nadu, Punjab and other areas.

The conference was inaugurated by Prof. T.C.A Anant, Secretary, Ministry of Statistics and Programme Implementations, Govt. of India, New Delhi on 6th Oct, 2012. Dr SS Gill, Vice Chancellor of Baba Farid University of Health Sciences, Faridkot was the Guest of Honour. Other dignitaries present were Prof. T. Krishnan, President, ISMS; Prof. Arvind Pandey Ex President, ISMS; Dr. R.C. Yadav General Secretary ISMS; Sh. Gian Chand Dhawan, Vice President DMCH Managing Society; Dr. Daljit Singh, Principal DMCH, Dr. L.S. Chawla Ex Vice Chancellor, Baba Farid University of Health Sciences, Faridkot, Dr. Sunil K. Katyal, representative of Punjab Medical Council and many others.

The scientific programme of the conference was held on all three days i.e. 6th to 8th Oct, 2012. Brief day-wise description of the scientific activities held is given below:

Day1, 6 Oct, 2012:

At the onset of the conference Dr V.K. Srivastava delivered Dr S.K. Bhattachayra Oration which was chaired by Prof. Rajesh Kumar, Chandigarh; Dr Rajoo Singh Chinna, Ludhiana and Prof. Arvind Pandey, NIMS, New Delhi.

Dr Dhijesh Tiwari, Director from CSO, MOSPI, New Delhi delivered talk on 'DevInfo'. Mrs. Seema Jain, IAS, Director Census Operation, Govt. of Punjab and representative of Registrar General of India, New Delhi highlighted in details about the Census 2011 and its methodology.

In afternoon session, there were free paper presentations by the researchers on the topics Epidemiology, Statistics, MCH, Communicable Diseases and Non Communicable Diseases. These sessions were held in parallel in three different halls.

Day2, 7 Oct, 2012:

The day 2 started with Symposium on Trends in Biomedical Communication by Dr NC Jain from ICMR, New Delhi. Thereafter technical sessions

on Sample Size calculation and Case Control design analysis were held to orient the researchers towards statistical techniques.

A special session on ART Regulation Bill – India was held which was conducted by Dr R S Sharma, ICMR, New Delhi. Along with these free paper presentations (both oral and poster) on topics Statistics, MCH, Communicable Diseases and Non Communicable Diseases were also held.

In the afternoon session, Col AK Jindal from AFMS, Pune delivered an invited talk on Health Insurance. Along with these free paper presentations (Oral) on different topics were also held.

Day3, 8 Oct, 2012:

On the final day of conference, symposium and technical sessions were held. Free paper presentations (Oral) on different topics were also held.

Valedictory function was organised which was attended by the office bearers of ISMS, Organizing Committee members of ISMSCON2012, Administrators of the host institute and delegates. ISMS President Prof T Krishnan announced the venue of the next annual conference of ISMS (2013) which will be held at CMC, Vellore. The function ended with vote of thanks.

Dr Daljit Singh
Principal

Dr R K SONI
Organizing Secretary
ISMSCON 2012

Appeal 2

Esteemed members of the Society and the Office bearers are requested to send their recommendations / nominations and interests to help construct Editorial Advisory Board (International and National Members); Editorial Board (including Medical Faculty) and the Council of Regional Editors (Northern; North-Eastern; Eastern; Western; Central and Southern Regions).

Members may be please forward the suggestions to the official e-Mail address of ISMS bulletin.

e-Mail: ismsbulletin2013@gmail.com


ISMSCON 2012
WELCOME DELEGATES


ISMSCON 2012
WELCOME DELEGATES


WELCOME DELEGATES
ISMSCON 2012
ISMSCON 2012
DR. ANURAG CHAITHANEY
DR. SUNIT KATYAL
Sh. G.S. BHUMBLA


WELCOME DELEGATES
ISMSCON 2012
ISMSCON 2012
ISMSCON 2012
6-8 OCTOBER 2012


DR. S. S. GILL
DR. T. K. KRISHNAN


WELCOME DELEGATES
ISMSCON 2012
ISMSCON


WELCOME DELEGATES
2012
G.C.DHAWAN


WELCOME DELEGATES


WELCOME DELEGATES


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ISMSCON 2012
ISMSCON 2012
30th Annual National Conference of Indian Society for Medical Statistics
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Recommendations of the ISMS
Silver Jubilee Committee – 2008

a) The Committee:

The President of ISMS, on 19 April 2008, constituted a Silver Jubilee Committee comprising the following:

Chairman:

Dr. Abhaya Indrayan, Delhi

Members:

Dr. PSS Sundar Rao, Bangalore

Dr. S Radhakrishna, Hyderabad

Dr. K Srinivasan, Mumbai

Dr. Prem P Talwar, New Delhi

Dr. VG Kaliaperumal, Bangalore

Dr. Padam Singh, New Delhi

Dr. Vinod K Srivastava, Lucknow

Dr. KR Sundaram, Kochi

Dr. Ajit Sahai, Pondicherry

Dr. Arvind Pandey, New Delhi

Member-Secretary and Convener:

Dr. Babu L Verma, Jhansi

b) Terms of reference:

To critically review the affairs of the Society (within and even beyond the constitutional provisions), i.e., its overall functioning and performance based on 25 years' experience, and recommend short as well as long term measures for improving its functioning and suggest steps for strengthening Society's on-going activities, with overall objective to further develop the discipline of medical biostatistics.

Domain of activities:

The Committee will look into the following, and will come out with workable proposals.

1. Critically review the affairs of the Society in the light of the constitutional provisions
2. Publishing Society's journal
3. Preparation of manuals on biostatistics/research methods for meeting statistical needs of medical professionals
4. Organizing future annual conferences in country's 'new States'
5. Involvement of Society in country's national issues relating to medical statistics
6. Improving financial status of the Society
7. Interaction of ISMS with regional/international organizations of common interest
8. Improving "medical" component in ISMS
9. Starting travel scholarship for retired / unsupported members for attending annual conferences

10. Regionalization of ISMS
11. Further improving ISMS website
12. Promotion of ISMS awards
13. Improving routine functioning of ISMS
14. Safeguarding the interest of members of ISMS
15. Improving membership
16. Improving image of the Society

The issues relating to education, training and research in medical statistics were considered but it was decided not to duplicate, and leave these issues entirely to the wisdom of the separate committee constituted for this purpose.

c) Life of the Committee:

Three years (19 April 2008 – 18 April 2011), unless any change is made in between by EC / GB.

d) Mode of action:

The Member-Secretary shall prepare Committee's initial draft on the business to be conducted. This draft will be sent to the Chairman for review, comments and modifications. The First Draft so prepared will be sent to all the Committee members for their comments, suggestions and any other inputs. In case of any controversy, issues shall be decided by the majority opinion within the Committee Members. The Member-Secretary and Chairman, in joint consultation, shall then prepare final recommendations of the Committee. The Final Report will be submitted to the Society.

e) Time limit for the report:

3 months (up to 18 July 2008) – extended to 15 October 2008.

Recommendations

Recommendations on the above mentioned specific items are given below.

1. <u>Review of the affairs of the Society in view of the constitutional provisions</u>

The following is provided in the constitution of ISMS:

Article - II

Aims

1. To *promote and advance the discipline of medical statistics including medical computing.*

2. To propagate principles of medical statistics in different areas of medicine, health, population and related disciplines

3. To formulate and advise the standards of education and training for medical personnel in medical statistics and to recommend adequate teaching facilities for the purpose

4. To promote research in medical statistics

5. To deal with any matter relating to medical statistics concerning the country and to do all other things as are cognate to the subjects of the ISMS

6. To safeguard the interest of medical statisticians and other members of ISMS

7. To promote ethical standards in the practice of statistics in medicine

These provisions are indeed ideal (such as the definition of health) and we are grateful to the vision of the founders who set an ambitious task. There is no need to tinker with them just because

we have not been successful in achieving some of these aims. However, some of the methods listed in Article III of the constitution can be examined.

Article - III

Methods

For the attainment and in furtherance of the above aims, the Society may:

1. *Hold annual conferences and periodic scientific meetings.*

   The Society has been extremely successful in organizing annual conferences, perhaps much more than many other such societies. Also, please see recommendation 4 of this report.

   Organizing periodic scientific meetings has been a weak point but is now picking up with the ad hoc Chapters organizing such activities. Those Chapters that have not been very active may be encouraged to organize at least one such activity per year. This can even be assigned as an 'essential' task.

2. *Print, publish, translate, sell, lend and distribute information whether in the form of a periodical, journal or books, monographs, treatises or pamphlets and distribute the same among its members/non-members.*

   The Society could not pursue this activity vigorously primarily due to lack of funding. Nevertheless, the Bulletin seems to be back on the track with commendable improvements. For journal, please see recommendation 2 of this report and for manuals, see recommendation 3.

3. *Publish annual reports of the Society and from time to time special bulletin*.

   Annual report is being published in the ISMS Bulletin. There is no need as of now of publishing special bulletins.

4. *Advise the Government and other bodies on various aspects of medical statistics including legislative, administrative, educational and research aspects*.

   Please see recommendation 5 of this report.

5. *To cooperate with professional and other bodies in the advancement of medical and other sciences including joining other national or international societies.*

   Please see recommendation 7 of this report.

6. *Purchase or acquire on lease or otherwise any movable or immovable property necessary or convenient for the purpose of the Society.*

   It is premature to look at this. The Society has not reached to this stage.

7. *Sell, improve, manage, develop, transfer or dispose off any such property of the Society.*

   It is premature to look at this. The Society has not reached to this stage.

8. *Collect subscriptions and donations; disburse funds for all or any of the aims of the Society.*

   Subscriptions and donations have been received. Please see recommendation 14 of this report on improving the membership. For disbursement, please see recommendation 9.

9. *Invest any money of the Society not*

immediately required for any of the aims in such manner as may, from time to time, be determined by the Society.

The available funds are being invested as per the wisdom of the office bearers. The Society does not have the kind of money needed to achieve the constitutional aims. Please also see recommendation 6 of this report on improving financial status.

10. *Do all such things and matters as are incidental or conducive to the attainment of the above objects or any of them which are subsidiary to the said aim.*

    This is the subject matter of this report. Please see all the recommendations.

11. *Create or assist in creating regional and local branches for any of the purposes aforesaid.*

    Chapters have been established on adhoc basis and some are active also. Others may be encouraged to be more active.

12. *Institute, maintain and grant prizes, certificates, awards and other distinctions*.

    This is being done with improvements from time to time. This may continue.

2. Publishing Society's journal

Because of one or the other problem, the Society has already waited for 25 years for starting a journal. We realize that a journal is a very important organ of a professional society. Some societies are recognized more for their journal than for other activities. Thus, there is a definite case now to strive hard to publish the journal. The following is proposed:

a. Two senior and willing persons, who enjoy the confidence of this Committee / present Council, should be identified as editors of the journal. They will form a Journal Management Committee (JMC) to manage different aspects of the publication. They should be given a reasonably free hand by ISMS to manage the journal, including forming an Editorial Board.

b. Name of the journal could be – Indian Journal of Medical Statistics or Indian Journal of Medical Biostatistics, or the like.

c. Initially its periodicity may be thrice a year only (to be increased later). Twice a year can be considered but there may not be many takers and reputed publishers may not be interested.

d. Some Indian and foreign publishers (like Sage and Wiley) also publish journals of professional societies, under some contract. These publishers should be approached for their terms and conditions. (In 2006, Dr Verma approached Sage in New Delhi for this purpose and had some encouraging telephonic discussions also. Recently, he explored possibilities with Wiley-Blackwell, Oxford, and they have asked for more information about our Society and the proposed journal. To send such baseline information to the possible publishers, Society needs to take policy decisions first about the journal, e.g., name(s) of editors, place of publication, cost bearing, etc.).

e. **Finances for the journal**: The JMC will generate funds through subscriptions, advertisements, donations, etc. Any financial deficit may be taken care of, on trial basis, by the ISMS. Further, JMC should work almost independently but in coordination with EC and present its audited accounts along with the report each year in annual Council and GB meetings. JMC should make every effort to make this journal financially self-supportive as early as possible.

f. Real problem may not be so much of funds as of getting quality articles that a national journal is expected to publish. Thus a caution is required.

g. Publication of ISMS Bulletin may be kept independent of the Journal for the time being. If journal becomes successful, the *Bulletin* may be merged afterwards with the journal.

3. Preparation of manuals on Medical Biostatistics / Research Methods for meeting statistical needs of medical professionals

Members such as Dr J Richard once suggested that the Society might think of publishing a book. Thus, we should now strive to prepare books on biostatistics and research methods, which may be useful to clinicians and health professionals. Although Indian market now has a large number of textbooks on biostatistics, few seem adequate to meet the demands of medical professionals for planning and analyzing their data. The need is to prepare a manual or a set of manuals that meets this demand in an effective manner. One option is to prepare manuals on specific topics where individual authors contribute chapters, and manuscripts edited and submitted for publication by editors. If this option is pursued then,

a. Topics and editors should be identified. These editors should submit title of the manual and a list of possible contributors. Some of these contributors could be medical professionals also. The cost of the preparation of the manuscript shall be borne by the editors who will also decide terms and conditions for publication with the publisher in consultation with President / EC.

b. The royalty shall be divided equally between the editors and the Society. These books will be publications of the Society and only Society will enjoy the copyright.

c. Each author and the members of the ISMS Council will receive free some copies of books. ISMS members may get copies at subsidized rates. Deliberation is needed on the other kinds of incentive to the authors so that quality is not compromised.

For the benefit of the ISMS members, publication of a biostatistics dictionary or a glossary can also be considered.

4. Organizing future Annual Conferences in country's 'new States'

Last year (2007) at Manipal, we did not have any concrete proposal for the next year's conference. This was unfortunate. The Society must have at least two proposals each year with intending

hosts being available during GBM to present their proposal. For this purpose, our EC – mainly Secretary and President, have to do a good amount of homework well in advance of the annual events.

The EC / Secretariat should somehow identify and motivate members – preferably from 'new States /places' for this purpose where ISMS conference has not reached yet. As we know, such States include North Eastern States, Gujarat, Bihar, M.P., Punjab, Haryana, and Kerala. Prominent places in the country where Society's future conferences can be held include Indore, Kochi, Goa, Chandigarh, Ahmedabad, Gangtok, Bhuvaneshwar, and Lakshadweep. EC / Secretariat should first try to get participants from these areas by extending invitation to them for attending our annual events – even to non-members, and thereafter motivate them for organizing our conferences. The organizers of the conferences must be properly rewarded in terms of ISMS recognitions so that they are encouraged to take up such a challenge.

We may also think of organizing appropriate events in SAARC countries in order to increase Society's visibility and for eliciting their participation. This should be done without being perceived as Indian society imposing itself on them.

5. Involvement of the Society in country's national issues relating to medical statistics

Dr PSS Sundar Rao suggested in 2005 that the Society should involve itself in national issues. This matter was discussed at length in Council and GB meetings held at Belgaum (2005). As a step in this direction, it was thought that the Society should take projects from agencies like ICMR, DST, MoHFW, etc., and also develop some linkages with these organizations (by suggesting them to utilize ISMS in different issues of national importance, such as keeping prominent biostatisticians as members in some of their committees). It was also decided to prepare a project proposal on behalf of ISMS and submit the same to the ICMR under its Task Force on Biostatistics but nothing further could happen in this direction. The Society may consider some incentives to the Principal Investigators of these projects since these ventures are going to be in the name of ISMS.

Society's involvement with national issues can be achieved in the following manner:

a. By members submitting projects on behalf of ISMS to funding agencies. The members may have advantage in getting sanctions when ISMS name is used.

b. By informing agencies like UGC, ICMR, NAMS, DST, INSA, and MoHFW (GoI) that experts in biostatistics are now available with ISMS and they may be involved in different committees, with their projects, etc.

c. Similar action may also be taken with international / regional agencies like WHO and UNICEF.

The steps for this may be taken by the President of the Society and a report presented in the annual meeting of the Council / GB with details of the efforts and outcomes.

6. Improving financial status of the Society

The Society's financial resources are meager. Some of the proposed activities of the Society like journal and scholarships to the unsupported delegates for attending its annual conferences (see, such a proposal below) can be pursued only when we have better inflow of funds on regular basis. Presently, membership fee and occasional donations are the only sources of income to the Society. As the annual increase in its membership is presently very low, annual income generated each year is also quite small (excluding income accrued on the fixed deposits). As regards annual expenditure, the working philosophy of ISMS should be: annual expenses will not exceed annual income (annual income includes interest on fixed deposits), unless there are some new initiatives.

To improve financial position of the Society, following proposals are made:

a. EC should identify and approach senior, particularly foreign ISMS members, who could consider donating some money to the Society.

b. Society should try to obtain grants from DST, which used to give funds for strengthening professional national societies. (This kind of grant was obtained by ISMS once in 80's).

c. Involving ISMS in national issues, e.g., by undertaking projects, may also generate some finances to the Society (this point however, needs to be debated).

7. Interaction of ISMS with regional / international organizations of common interest

To have better visibility and recognition, ISMS should now explore possibilities with regional/ international organizations located in the country, such as *WHO: SEARO* and *India Country Office* and *UNICEF: India Country Office, etc.,* for its involvement with their programmes. Specified representatives of ISMS may approach these organizations for this purpose. One or two senior ISMS members, preferably based at New Delhi, may be more helpful (and so can act as ISMS representatives). Some Silver Jubilee Committee members and few others in ISMS may also provide help. A nodal person should be identified for this purpose. The Society may identify experts who would be effective in interacting with the international organizations. A mechanism may be drawn so that the time and expertise devoted by these experts is compensated in one form or the other. Motivation can become an important issue in such efforts.

Some prestigious professional societies, such as International Epidemiological Association (www.ieaweb.org), have recently started offering their membership on nominal payment to the members of national professional societies under their 'joint membership program'. ISMS should examine these opportunities for its members and ISMS members should consider availing such provisions.

8. Improving "Medical" Component in ISMS.

The group that started this Society in 1983 included two medical doctors. Also, in a Society

like the one on medical statistics, "medical" component cannot be ignored. In fact, in ISMS, both 'medical' and 'statistics' should be adequately represented. Initially this point was taken care of to some extent, but it gradually lost focus. To take care of this, following steps are desired.

- Increasing emphasis on enrolling medical persons as Life Member
- Encouraging medical members for organizing and attending ISMS conferences (we can organize special sessions, keeping their interests in mind, such as problem solving sessions, sessions on study designs and data analysis, workshops on scientific medical writing and publishing, etc.)
- Using medical language, as far as possible, in our technical programmes
- Keeping at least one medical person in each of our committees and sub-committees (barring few exceptions)
- Electing a medical person as Fellow in alternate years – subject to the fulfillment of FSMS criteria by the nominee
- Promoting interactions between medical professionals and biostatisticians in ISMS in all other possible ways

9. Starting Travel Scholarship for retired / unsupported members for attending annual conferences

Senior members of ISMS are gradually retiring. Also, a section of delegates do not have institutional support to attend its annual conferences. At times, these unsupported / retired members are also elected as committee-chairs, speakers, session-chairs or members of the ISMS Council. In such a case, their presence becomes more wanting.

To meet this end, the ISMS may start a Travel Scholarship Scheme, provided funds are available. Under this scheme, applications should be invited each year according to some laid down criteria. A 3rd AC return train travel may be given to up to 3 applicants and their local hospitality (registration fee, stay, local travel, etc.) should be borne by the host organizer of the conferences. A sub-committee of 3 senior ISMS members (say, President, Immediate Past President and the President-Elect) may decide the criteria and evaluate the entries received. Its recommendations should require approval (through electronic communication) of the Council only (GB clearance should not be needed). This may start initially on trial basis and regularized in due course.

10. Regional Chapterization in ISMS

Last year (2007) at Manipal, the idea of setting up Regional Chapters was placed straight away in GBM and these were started also on ad hoc basis. The proposal was not properly discussed in EC or at any other forum. ISMS have a built-in system, i.e. it has rules / by–laws for the HQ office but not yet for the Regions. The decentralization of an organization should be encouraged without diluting the strength of the HQ. The present centralized system is running smoothly but the risk of weakening the main organization is yet to be assessed.

The continuing ad hoc proposal of

chapterization may be reconsidered in the light of the following:

- We have not created any system for Regions.
- Their number and boundary definitions are unclear.
- Our HQ office needs further strengthening.
- Budgetary provision for chapters is not there (after 2008).
- There is some risk of weakening the HQ (so many Regions may affect ISMS country-based working. Also, Chapters may ask for funds from time to time which may not be feasible after 2008. It might also bring some politics in the present working of ISMS.)

On the other hand, if it is perceived that this would give a feeling of participation and satisfaction to some members, without causing concern to the centralized structure, the idea can be pursued. If we agree in the Council / GB that ISMS should presently decentralize, we should place a system first for the Regions and implement the idea gradually by starting only 2 Regional Chapters (say, North and South). Even this has potency to divide. In fact, we should not commit anything beyond our means and control.

At the same time, the Committee noted that some chapters are doing commendable job even if the name of the Society is rudimentarily appended.

11. Further improving ISMS website

We should appreciate efforts of Dr P Venkatesan – Web Coordinator, and his team for construction of a new website of the Society. As the website is the mirror of any organization, we feel its material should be reviewed properly since human errors of omission and commission are always possible. A small group of 2-3 members (other than web coordinator and web master) may be constituted to review; advice and authenticate the material, before publishing the same on the website.

The content of the site should be regularly updated. List of Fellows, Membership Directory with members' e-mail IDs (along with a provision of updating mailing addresses by members themselves), EC / GB Minutes, winners of the Awards and the Oration, rules and regulations, various committees, etc., should be available on the website.

12. Promotion of ISMS Awards

So far we could not make ISMS awards attractive enough amongst its members. An evidence of this is inadequate number of entries received almost each year by the ISMS for its different awards. In past few years, the Society also took a decision to promote the awards by giving a wider publicity through all possible ways but could not be vigorously pursued. These awards need to be promoted by giving a wide publicity each year. Following is proposed:

- Secretariat may prepare a document (hard & soft) on the ISMS awards for wider circulation and publicity.
- The document inviting entries should be sent to all the members, preferably by e-mail, by the middle of each year.

- ‘News on ISMS Awards’ should be sent for publication in the beginning of the year to the ISMS Bulletin, University News, IBS Bulletin, RSS News, and in other similar useful periodicals where there are no financial implications.
- Copies (hard) of the above document should be sent well in time to all prominent medical and statistical institutions of the country inviting entries.

13. Improving routine functioning of ISMS

In order to further improve the working of the President’s office, Secretariat and the Treasurer’s office, following suggestions may be pursued:

a. Constitutional provisions / by-laws should be fully followed while discharging functions of the Society by its office bearers.

b. President, Secretary, Treasurer and the Editor, should get approval of their projected budget for the coming year by the Council, and funds should be released and spent accordingly.

c. Nominations / Entries for various purposes (e.g. for FSMS, various awards, election of the office-bearers, etc.) should be received by the respective Committee-Chairs / Conveners and not by the Secretariat (as it is done presently).

d. Society’s functioning during past one year should be assessed in the light of previous / last year’s EC and GB decisions.

e. Secretariat should be more communicative with the members, circulate EC meeting minutes to the EC members prior to the subsequent GB meeting, and ensure circulation of GB minutes to the members within 3 months from the date of the Annual Conference. Secretary must give notice / information to the EC and GB members and send the agenda items well in time (as per the by-laws).

f. Tradition that Treasurer and Secretary should be from the same place need not apply every time. Treasurer should work independently but in close consultation with the Secretary and the President.

g. Reports of Secretary, Treasurer and Editor should have formal approval of President well in advance, much before presentation in EC / GB. These reports need to be more informative and should have been prepared in the light of previous / last year’s EC / GB decisions.

h. Secretary and Treasurer must run an “ISMS Counter” in every ISMS conference, at least on first two days, to enroll new members, update members’ addresses and e-mail IDs and resolve members’ complaints, if any. They should have Membership Register and Membership Payment Record with them to satisfy members in case of any complaint.

14. Safeguarding the interest of members of ISMS

During past few years, members have raised issues related to their service conditions, lack of recognition, lower pay scales, unsatisfactory working facilities, stagnation / lack of promotion, etc., and wanted the Society to pursue their cause with the Government / concerned organizations. On one occasion, an ISMS member working as Lecturer in Statistics & Demography in the Post Partum Program (PPP) sought help from ISMS when his State Government had almost decided to close the PPP, thus putting him and his colleagues in the State to risk of being jobless. Occasionally, members have raised their concern against lower importance shown for biostatistics in their institutions / States—thus adversely affecting development of discipline and also the interest of biostatistics faculty. Though safeguarding interest of members has been one of the Society's objectives but nothing much could be done in the past on this count.

Following is proposed for this purpose.

1. Priority may be given to sensitizing the medical community that biostatistics is an important medical discipline and deserves a better place. For all medical and other allied colleges, including where no biostatistics faculty exists, the flyers of the book of Dr Indrayan were intentionally addressed to the Biostatistics Teacher or Lecturer of Biostatistics or even Head of the Department of Biostatistics in some cases. This had marked effect on some colleges as they realized that this subject also has such faculty in some other colleges and they should also try to have biostatistics faculty. Such efforts can be useful in sensitizing the medical community about this subject and about the biostatistics professionals.
2. Recognition of the worth of biostatistics professionals is relatively easy when such professionals learn some basic facts of medicine particularly as applicable to medical research. The consultation then is much more effective. This can come by experience but more by keenness to learn. This report has already emphasized the need to interact with medical professionals.

   The interest of biostatistics professionals in general and of ISMS members in particular is better protected when biostatistics is perceived as a medical discipline and demonstrated as a useful discipline. The steps suggested above may be helpful toward this end.
3. Biostatistics professionals should be more aggressive so that they are represented in institutional bodies such as Teachers Association. This could help in keeping tab on any proposal that can adversely affect them as in promotions and pay-scales. Biostatistics professionals should have same opportunities as other medical professionals.
4. The Society should strive to send representations on behalf of biostatistics professionals in bodies such as Pay Commissions and Ministries who decide about the pay-scales and promotion modalities. Also, in case an issue concerning any particular member emerges, the Society may deliberate if the issue is worth its intervention. The issue should preferably be

in the larger interest of the members.

The grievances of members may be submitted to the President with cc to the Secretary as a soft copy. The complainant will also propose possible solutions. The President, in consultation with the Council members – preferably through electronic correspondence, may decide what action, if any, is required. Ordinarily, action on such matters will be taken within a period of 2 months from the date of the receipt, except where President want to discuss the same in the forthcoming GBM in the larger interest of the Society. The concerned members shall be duly informed by the Secretariat about the fate of their written complaint.

15. Improving membership

Special emphasis on enrolling new members through "Membership Campaigns" is needed. Obviously, these campaigns shall have to be undertaken by the ISMS Secretariat. Following proposals are made for this purpose:

a. Enroll new members in Annual Conferences of ISMS. For this, an "ISMS Counter" may be located at a prominent place during the annual event. During the course of the conference, there should be periodic announcements for this purpose for non-members attending the Conference. Those attending Pre-Conference workshops will be the most relevant group to be approached for this purpose.

b. Secretariat should approach relevant institutions of the country for becoming "Institutional member".

c. In institutions that are running M.Sc. (Biostat) or a similar course, concerned Head of the Dept. should be approached by the Secretariat for enrolling such students as members of ISMS.

d. Prominent institutions like ISI (Kolkata), ICDDR, B (Dhaka), IIPS (Mumbai), PGI (Chandigarh), which have been actively involved with ISMS in the past, should be approached by the Secretariat and Organizing Secretary of the conferences for sponsoring faculty members to attend our annual events and in helping the Society for enrolling new members.

e. Links should be developed by the Secretariat with institutions of SAARC countries for attending ISMS events and for becoming ISMS members.

f. Special membership campaigns should be undertaken from time to time by the Secretariat by exercising other suitable options.

Further, each person on becoming a member should get a *Welcome Letter*, which should be properly designed on ISMS letterhead. This must be sent by the Secretariat along with receipt of first payment.

16. Improving image of the Society

Many of the activities proposed above would go a long way in improving the image of the Society. Nonetheless, we can think of other ways and means to provide a boost to its present image. Secretariat efforts may include a standardized letterhead on excellent paper, prompt redressal of queries, excellently produced annual reports and their wide circulation, etc.

Recommendations of the ISMS Core Committee on Education, Training and Research – 2008

ISMS Core Committee on Education, Training and Research

Chairman:

Prof. K R Sundaram – AIMS, Kochi.

Members:

Prof. Abhaya Indrayan – UCMS, Delhi.

Prof. Subbakrishna, NIMHANS, Bangalore.

Prof. Arvind Pandey, NIMS, New Delhi.

Prof. B L Verma, MLBMC, Jhansi.

Prof. N S K Nair, Manipal University, Manipal

Member Secretary & Convener:

Prof. Ajit Sahai – JIPMER, Pondicherry.

Broad Objectives and the Task-in- hand:

1. To oversee formulation / framing of course-curricula in Medical Biostatistics for various medical Post-Doctoral/ PG/UG courses and also for applied and allied Sciences including M.Sc. in Biostatistics; Field and Clinical Epidemiology; Public Health and Research Methodology etc. Through various sub-committees, if desired so.
2. To frame guidelines for conduction of various short and long-term refresher and continuing Education Courses.
3. To identify and nominate a variety of ISMS Research Core-Groups to support research in various fields conducted by National/ State Governmental organizations and NGOs.

Detailed Terms of Reference (TOR) shall be worked out by the committee's Member Secretary in consultations please.

Modality of interactions: Through mails / telephonic conversations.

Time limit for the first draft report: Three months.

Life of the committee, unless extended further or curtailed by ISMS EC/GB: Three years

I. Education:

Proposal on Education in Medical Biostatistics, Epidemiological Methods and Research Methodologies for the Undergraduate, Postgraduate and Para-Medical Courses

(A) "Teaching Medical Biostatistics and Epidemiological Methods in Medical Undergraduate Course"

The importance and relevance of Statistical and Epidemiological Methods in medical and public health research and administration is well recognized now. It has also been well understood

that the training in these areas should be started right from the undergraduate course itself. However in practice its implementation has not taken place up to a satisfactory extent. Though, Medical Biostatistics has been taught for the under-graduates in most of the medical colleges, epidemiological methods has not been taught for this course to a satisfactory level in any of the medical colleges in our country. There may be exception for this in a couple of medical institutes/colleges. In many conferences, workshops and forums several discussion have taken place and many papers and reports have been published on the existing situation of teaching Biostatistics in medical colleges and possible methods of its improvements, both in terms of quality and quantity. The society (ISMS) on its part made recommendations to the Medical Council of India (MCI) for improving teaching of Medical Biostatistics in the medical curriculum. However, the anticipated impact of these recommendations on the curriculum and its teaching has not been seen yet. MCI though has acknowledged the need to cultivate scientific and logical thoughts amongst doctors and has recognized Medical Biostatistics as a front tool to achieve this goal, the subject has not been taught to the medical students keeping this in mind. The students on their part start taking interest in the subject only when they study a post-graduate course where a thesis/dissertation is a mandatory requirement and Biostatistics is very essential in preparing a thesis/dissertation and hence the students have to take interest in understanding and applying statistical methods not only in their data analysis, but also in planning and execution of their studies.

Ideally, training in Medical Biostatistics should be started in the under-graduate course itself, possibly in the first year itself. In most of the medical colleges, Biostatistics is taught in the third/fourth semester or 2nd year of the course when the students have to study Community Medicine/Social and preventive Medicine. But, since there are lot of references and applications of Statistics in Physiology, Biochemistry and Anatomy, the subject should be taught in the first year itself when the students are studying these subjects. The objective of the course in Medical Biostatistics and Epidemiology should be as follows:

At the end of the course, the student should be able to

1. Collect scientific data applying appropriate Designs.
2. Organize and analyze the collected data applying appropriate descriptive and inference statistical methods to draw valid and meaningful conclusions.
3. Get familiarized with the sources and level of the current Vital, Health and Population statistics of the country and to understand and appreciate the relevance and importance of population control.
4. Understand the concept of Epidemiology of disease and epidemiological methods.
5. Understand and appreciate the priorities of health services and health care delivery in the country.
6. Develop scientific and logical thoughts not only in medical research, but also in hospital and community health care.

Let us first investigate the draw-backs in the existing teaching system of Biostatistics and reasons for the same.

1. There is lot of variations in the syllabus of the subject being taught.
2. There are variations in the duration of the course. For example, in some medical colleges, this subject is taught in less than ten lectures but in some other medical colleges it is taught in more than 20 hours.
3. Lack of practical exercises using medical and public health data applying various statistical methods.
4. There are variations in the placement of the course. In very few medical colleges statistics is taught in the first year itself. In most of the medical colleges, it is taught after completing the pre-clinical subjects.
5. In many of the medical colleges the number of students in the under-graduate course is very large, sometimes more than 150. If a subject is taught in a class consisting of more than 50 to 60 students the interaction of the students with the faculty will not be achieved to a satisfactory level.
6. Non availability of trained faculty in teaching medical statistics. In some medical colleges, the subject is taught by the faculty in community medicine, which may have certain limitations. A post-graduate in Biostatistics or in Statistics with some training in Biostatistics will be the most appropriate person to teach this subject properly. In certain colleges due to the lack of trained faculty in Statistics, the subject is taught by Mathematicians which may not serve the desired purpose. The Mathematician will be more tuned in theoretical statistics and will be prompted to approach the problem theoretically using complex and difficult formulae and theorems. This will have negative reactions amongst the medical students who usually keep mathematics at a distance. They should be engaged in teaching the subject only after they undergo at least a short term course in medical biostatistics so that they will get themselves familiarized with the medical terminologies and applications.
7. Not using relevant and appropriate medical and public health examples for demonstration of various applications of statistical methods depending upon the objectives. Sometimes the teachers use examples from agriculture and industry to demonstrate the applications which may not be appreciated and liked by the medical students.
8. Non availability of appropriate simple text books in the subject to the students and the faculty. Most of the available books are written by foreign authors with examples which may not be of any use or applicability in our situation, are used. Some books in Medical Biostatistics written by Indian authors are available now. But, more books on various specific topics in statistical and

epidemiological methods should be made available to the students and Faculty for better understanding in teaching. Moreover, the number of books available in the college library may be very limited for distribution to the students in many of the Medical Colleges. The students should be encouraged to refer few text books also in addition to the class notes; they might keep while attending the classes.

9. Lack of integrated approach in teaching. Since the subject of Statistics has applications practically in all aspects of medicine and public health, and there are connections and links amongst various medical subjects an integrated approach of teaching will be more meaningful and appropriate. Seminars with various relevant departmental faculties should be arranged for the students so that the applications will be brought out clearly by integrating various medical subjects and the students will have opportunities to understand the applications in the best possible ways.

10. Non availability of computers for a practical demonstration of statistical packages. Now we are in the age of computers and internet, but, unfortunately many of the medical colleges do not have computers for practical demonstration to the students. Fortunately, there are a variety of statistical packages available now by which it is possible to apply even very advanced statistical methods for the analysis of data in no time. Medical Colleges should have sufficient computers for use of this facility.

11. Absence of a separate examination, in the subject. In none of the medical colleges in our country there is a separate examination in Biostatistics which the students have to pass for promotion. There is a great deal of variations in the examination system amongst the medical colleges. In some colleges, a question in Biostatistics or its application is asked as part of a Community Medicine paper and in some other colleges it is asked only during viva-voce examination. This system has to change and there should be separate full paper in Biostatistics and Epidemiology so that the student will show interest in learning these subjects and while doing so will acquire sufficient knowledge which could be made use by them in their post-graduate courses and in the subsequent research work.

12. General apathy and indifference to the subject from the authorities and the students. While the students do not like subject that much and do not want to study it in their course, the authorities also show indifferences and apathy towards these subjects, altogether making them unimportant and sometimes unnecessary subjects.

Recommendations:

Given below is a Teaching Model in Biostatistics and Epidemiology for the undergraduate course:-

1. The subject of Medical Biostatistics should be taught, possibly in the 1st semester and 3rd and 4th semesters in case of semester system and in the 1st year and during the time of Community Medicine course, in case there is no semester system.

2. In the first semester /1st year, after giving an introduction to Medical Biostatistics and relevance of this course in medical under-graduate curriculum, Descriptive statistical methods should be taught (Part –I).

   Both lectures and practical should be arranged. A total of five lectures of one hour duration and three practical of two hours` duration would be the ideal pattern. Examples should be taken from data related to Anatomy, Physiology and Biochemistry so that the students can appreciate the subject when they are actually learning these pre-clinical subjects.

3. In the third semester - (2nd year), after a revision class in Descriptive statistics methods giving some examples of their applications in data related to Community Medicine, Inference Statistical methods should be taught (Part-II). One hour may be allotted for revision class. Seven lectures of one hour duration and three practical of two hours` duration may be arranged for teaching Inference Statistical Methods. Examples should be taken not only from Community Medicine, but, from Para - clinical and clinical subjects.

4. In the fourth semester - (2nd year), Health and Vital Statistics and basic principles of Epidemiology and Clinical trials should be taught (Part III). Ten lectures and three practical may be arranged for teaching these topics.

5. At least one class examination should be held in these three sessions of teaching. At the end of each session, a final examination should be arranged. If this is not possible, at least one final examination should be arranged at the end of 3rd session covering all the topics taught in the three sessions.

6. The examination paper should be exclusively for Biostatistics including Descriptive, Inference and Health and Vital Statistics (Total marks should be 100 and the passing percentage should be 50%). There should not be any compromise on the issue of a separate examination in Biostatistics. The subject should be treated as any other medical subject and the rules and regulations for pass and promotion should be the same as in case of the medical subjects.

7. The students should be encouraged to keep practical record books in which the problem, data and the results and the interpretations should be written. This would help the students to get sound and practical knowledge in the applications of various statistical methods to the medical, biological and public health data. This will also help them in preparing a meaningful and statistically

valid thesis/dissertation during their post-graduate/doctoral degree course.

8. Sufficient number of simple text books in Biostatistics and Epidemiology should be made available in the library for the benefit of the students and they should be encouraged to refer these books while learning the subject.
9. Though it would be ideal to give the students training in solving medical, biological and public health problems using statistical software package in the computer, this may not be feasible in all the medical colleges due to the non availability of sufficient computers. However, attempts should be made to procure at least the minimum number of computers for the use of the students and they should be given practical training using the statistical package in the computer for solving medical, biological and public health problems.
10. Attendance should be made compulsory for all the students since continuity of attending the lectures and practical is very important in learning these subjects.

A model similar to the one given above, with some variations, already exists in Gulf University (Sulthan Qaboos University, Muscat, Sultanate Oman). In this model three separate courses, including one for practices using computers, are given. The model in that University is well accepted by the medical students and this course is very popular now. This model is very much appreciated by experts in many countries abroad.

Though, the model given above is an ideal one, it may not be feasible and practical to follow this, as it is, in our system of under-graduate medical education in the country. However, an attempt should be made in consultation and approval of the Medical Council of India (MCI) to adopt a similar pattern of course in Biostatistics and Epidemiology for the under-graduate medical education in our country. The most important thing is following a uniform pattern of teaching this course to the medical under-graduate students with a proper examination in this subject at the end of the course. Without an examination the students my not give that much attention to this subject in the midst of so many other medical subjects, they have to learn during their course and have to pass examinations in these subjects. It may not be feasible in the present circumstances to suggest a full course in practical using computers due to the non-availability of computers / sufficient computers required for the students. But, at least these should be practical problem solving sessions as a part of the course where the students should be in a position to apply the important statistical methods. It is ideal to introduce the subject of Biostatistics in the first year itself and later, Inference statistics and Health and Vital statistics can be introduced when the students have to study Community Medicine / Social and Preventive Medicine. A trained post graduate in statistics with specific training in Medical Biostatistics should be appointed in each medical college to teach the subject. Appropriate medical and biological problems should be used in demonstrating the application of statistical methods and their interpretations. Wherever and whenever possible; integrated teaching involving allied subjects and the application of statistical

methods to these subjects should be included in the teaching curriculum. In the introductory lectures the importance of Medical Biostatistics and Epidemiology should be convincingly highlighted with appropriate examples so that the students will take interest in learning the subject and appreciate their applications to the medical, biological and public health data. Only the minimum possible formulae and mathematics should be used while teaching this subject. Since, the problems can be done using statistical software packages, the concept, importance and applications of various topics should be dealt with rather than solving the problems using the complicated formulae. The authorities also should not neglect this subject and include it as an essential subject in the curriculum. Sufficient number of simple text-books in Biostatistics and Epidemiology should be made available in the Library for the use of the students and they should be encouraged to go through some of these books during the course.

We strongly believe that the suggestions and recommendations listed above would be certainly useful to the MCI and the appropriate authorities to adopt a relevant model in teaching Medical Biostatistics and Epidemiology for the undergraduate students in our country. At least an attempt should be made to review the existing teaching pattern of this subject in various medical colleges and modify the same in such a way that the subject gains importance which it deserves in the medical curriculum.

SYLLABUS

PART – I

a) Lectures:

1. Introduction to Medical Biostatistics (Need, Uses & Applications, Definition of important basic terms).
2. Methods of data collection, Principles of Sampling and various Sampling methods.
3. Descriptive statistical methods (Tables and Diagrams)
4. Descriptive statistical methods (Measures of Averages & Variability) -Variations and uncertainties in health and medicine
5. Correlation and regression analysis

b) Practicals in:

1. Tables and Diagrams
2. Measures of Averages & Variability
3. Correlation and regression analysis.

PART – II

a) Lectures:

1. Concept of probability and important Probability Distribution (Binomial, Poisson and Normal)
2. Logic Statistical Inference, Concept of Standard Error and Estimation of Population Parameters.
3. Concept of Type-I and Type-II errors and principles of test of Significance of Hypothesis.
4. Estimation of minimum sample for various study designs.
5. Test of Significance: Z-Test and Student t-tests.
6. Test of Significance: Analysis of Variance (ANOVA).

7. Test of Significance: Chi-square Tests

b) Practicals in:

1. Z-Test and Student's t-Tests
2. Analysis of Variance
3. Chi-square Tests

PART - III

a) Lectures:

1. Introduction to Vital statistics
2. Population statistics
3. Various indices of Fertility, Mortality and Morbidity
4. Standardization of Rates
5. Life Table – Principles and Applications
6. Hospital Statistics, International classification of Diseases and causes of Death
7. Introduction to Epidemiology & Epidemiological investigations (Principles and Types of Studies)
8. Risk analysis methods
9. Basic Principles and Methods of screening
10. Basic principles of clinical trials

b) Practicals in:

1. Fertility, Mortality and Morbidity
2. Standardization of Rates
3. Basic Principles and Methods of screening

Requirement of Staff and Equipments

In order to be effective in fulfilling the above indicated requirements, it is necessary that a Biostatistics Unit is established in the Department of Community Medicine. The Biostatistics Unit, besides teaching, will meet the requirement of the department in developing and maintaining records of their health centers, and to provide the entire faculty necessary statistical support in their research endeavours. In the colleges with the post graduate students, the teachers in the Biostatistical Unit will provide statistical guidance to the post graduate students of all the departments in planning the experiments / surveys needed for the PG thesis and in the analysis of research data and in the presentation of results. The current statistics staff with just one person at the level of a lecture is extremely inadequate to meet all these needs. Thus, it is proposed to the MCI that:

There should be a **Biostatistics Unit** in the Department of Community Medicine with the following as the minimum requirements:-

Staff: Assoc: Prof. / Reader- 1 and Asstt. Prof. / Lecturer -1.

Computer: At least one

Since it is essential in modern times that the postgraduate students is exposed to programming and computer processing of medical data, it is further suggested to the MCI that

Biostatistics Unit in medical colleges with postgraduate students should be a separate Department and should have a Professor in addition to the above mentioned staff members and also should have more than one computer depending upon the number of post graduate courses and strength of post graduate students. Since computing facilities are also looked after by the Faculty in Biostatistics the Department may ideally be named as the Department of

Biostatistics and Computing.

Senior Medical Faculty, Scientists and Medical Biostatisticians who would have influence on the members of the MCI should be identified and a small Committee of these members should be formed to approach the MCI and to convince it the importance and relevance of Medical Biostatistics in the UG curriculum and to include the establishment of a separate Unit of Medical Biostatistics and Computing with sufficient staff and computers as an essential requirement in each Medical college in the MCI Rules & Regulations. MCI may be requested to consider other recommendations also for the UG programme for improving the quality of medical education.

(B) Guidelines Which may be sent to all the Medical Colleges offering Post Graduate Courses in Medical and Allied Subjects

Various post graduate courses in Medical and Allied subjects are offered in many Medical Colleges and Institutions in our Country. Special and Specific guidelines may have to be prepared with respect to Teaching Biostatistics and Epidemiological & Research Methods to the students of these courses. Though the students are supposed to be equipped with the basic knowledge in these areas in their undergraduate courses and since these subjects are not taken seriously in many medical colleges due to a variety of reasons; special attention may have to be given while preparing the curriculum and requirements for these courses. Since there are a variety of PG courses such as MD & MS, DM & M.ch, DNB, M.Sc. and Ph.D. existing in Medical Institutions curriculum has to be prepared keeping in view of the requirement, importance and specific applications in their fields. The following are some of the suggestions which may be recommended to the Medical Institutions as Guidelines for achieving good standards in PG education & research:-

(1) A Compulsory course in Biostatistics & Research Methods may be made mandatory to the Ph.D. program. A Three months` course may be planned for this course -one hour lecture three days in a week totaling to about 36 hours may be planned. Practical classes for problem solving in Computers using statistical softwares such as SPSS, SYSTAT STATA or SAS may be planned. Each practical session may be of two hours` duration and there should be about 10 practical sessions, totaling to 20 hours. Practicals in a topic should be held soon after the lecture on that topic. Efforts should be made to provide appropriate hand out material to the students. There should be an Examination at the end of the course and a Certificate should be issued to those getting a minimum of 60 % marks. Only those students who get the Certificate should be allowed to register for the Ph.D. program. A supplementary Examination may be held for those who students who could not get 60 % marks.

(2) For the other PG courses all the above mentioned recommendations may be included, except that the students who get 60 % marks may be given the Certificates, but, it need not be an essential requirement for doing the Thesis / Dissertation work.

(3) All the PG students should be encouraged to

do their data analysis work themselves in the computers under the supervision of the Faculty in Biostatistics.

(4) Creation of a Biostatistical Laboratory with enough computers in which statistical software are installed should be recommended in each medical Institution with PG programs.

(5) A set of topics based on the requirements, importance and relevance is given at the end. This list may be useful while preparing the curriculum for each of the PG course.

(C) Guidelines which may be sent to all the Medical Colleges offering various Para-Medical Courses in Medical and Allied Subjects

Various Para-medical courses in Medical and Allied subjects are offered in many Medical Colleges and Institutions in our Country. Special and Specific guidelines may have to be prepared with respect to Teaching Biostatistics and Research Methods to the students of these courses. Special attention may have to be given while preparing the curriculum and requirements for these courses. The Para-medical courses which are commonly offered in the Medical colleges are:-

M.Sc. courses in:

Anatomy, Biochemistry, Physiology, Pharmacology, Biotechnology, Biophysics, Hospital Administration, Laboratory Medicine and Nursing

B.Sc. courses in:

Human Biology, Ophthalmic techniques, Medical technology in Radiography, Medical Technology in Speech & Hearing, Laboratory techniques and Nursing

(1) Syllabus in Biostatistics & Research methods; number of classes; examination modalities and other details have to be worked out according to the needs and requirements of these courses. Examples and Practicals should be planned based on the corresponding subject so that they are appreciated and understood by the respective students

(2) Lectures in basic topics in Biostatistics can be held together for all the courses. Lectures in specific topics related to the needs & requirements of the respective courses can be planned and held separately

(3) Separate Examination should be held in Biostatistics for each of these courses. It should be made mandatory that the students should get a minimum of 60 % marks in the Examination as a requirement of awarding the Degree.

(4) A set of topics based on the requirements, importance and relevance is given at the end. This list may be useful while preparing the curriculum for each of the PG course.

Specific Topics for PG and Para-Medical Courses in various Subjects

Statistical methods in Biological Assays
Statistics in Diagnostic & Screening methods
Quality control methods
Survival analysis methods
Factor analysis methods
Risk analysis methods

Statistical methods in Evidence Based Medicine
Population Dynamics
Demography & Vital Statistics
Validation of Questionnaires
Multivariate Linear Regression analysis
Multivariate Logistic Regression analysis
Statistical & Clinical Significance
Health Information System
Statistical methods in Clinical Trials

Relevant topics from the above given list are to be offered to the PG & Para-medical courses depending upon the requirement on the application of those methods to the type of research data / Laboratory data in the course subjects, after they are exposed to the basic topics in Biostatistics and Epidemiological & Research methods outlined in the Syllabus suggested for the Medical Undergraduate course.

II. Training:

Proposal on Training Programmes for Statisticians and Medical Researchers

Biostatistics is a growing subject and many students of Statistics would like to specialize in various aspects of Biostatistical Methods. The importance and relevance of Statistical & Epidemiological methods in designing valid research projects in the fields of Medicine, Biology and Public Health and in analyzing the data applying appropriate Biostatistical methods for meaningful and valid interpretation of the result have been well understood now. Its importance in Public Health administration in identifying health priorities, causative factors of various diseases and proper allocation and utilization of the available budget appropriately and judiciously has also been well recognized now. There is an ever-growing demand for this subject due to this reason.

In the past, as well as, in the present, the post-graduate education in Statistics in most of the Universities in our country is mostly on the theoretical aspects. Topics in practical aspects covering examples on the application of statistical methods on different fields, especially on medical problems are almost negligible. Though some examples on Agriculture, Economics & Industry are covered, practicals on medical problems are rare. Hence, it is natural that students who are not exposed to the applications of statistical methods to medical & health problems find it difficult when they join medical colleges or medical research institutes for employment.

In teaching, they may be tempted to use examples in Agriculture, Economics & Industry and teach the topics with derivations of formulae with a theoretical approach. This will bring a negative attitude among the students in learning this important subject. Also, their lack of exposure to the applications of statistical methods in medical & health problems may lead to invalid design & wrong statistical analysis resulting to misleading interpretations & conclusions.

This situation can well be avoided by giving meaningful an appropriate training to the in-service statisticians as well as to those post graduate students who pass out from the universities. Such training courses are essential for improving the quality of teaching. Biostatistics to the medical students and also the quality of research work being carries out in

medical & health research institutions. Such courses will be highly beneficial to the young statisticians in advising the medical & health researchers in designing their research projects scientifically, in maintaining the quality of data applying appropriate statistical methods and also in the interpretation of the results obtained, meaningfully and validly. Short-term Certificate courses for the in-service statisticians and long – term Diploma courses for the fresh post graduates may be appropriate.

Though, there are a variety of courses in Biostatistics at the post graduate level in many foreign universities, only a very few such courses are available in our country. It is high time now that post graduate courses of one or two years duration should be started in more universities in our country for the benefit of those students who would like to specialize in Biostatistics after their graduate/ post graduate courses in Statistics or Mathematics with Statistics.

Besides this one year Diploma or two years Degree courses, there is a need for conducting regular short-term courses for the in-service statisticians working in medical colleges and research institutions. The duration could be varying from one to three days for a pre-conference workshop to three months for an extensive Certificate course.

One to two days pre-conference Workshop on specified topics is very common in International conferences. Longer duration workshops/Training courses on applied topics in Biostatistics have been / are being conducted by many foreign universities frequently depending upon the demands for such courses. Conducting Pre-conference courses of one or two days` duration has become part and parcel of the ISMS conferences since the conference in Lucknow. Since then pre-conference courses are regularly held in each year. Response to these courses has been very good right from the first one in Lucknow

Indian Society for Medical Statistics had conducted a couple of short-term courses in the past. One such course was held in the Department of Biostatistics in All India Institute of Medical Sciences, New Delhi in December 1995. A total of 34 biostatisticians from various medical colleges & Research institutions participated in this workshop. A total of 19 topics in various Biostatistical methods in Inference & Evaluation, which are commonly applied in medical and public health research, were covered in this workshop. Eleven resource persons who were/ are faculty or holding senior posts in research institutions gave lectures and participated actively in the discussions. A study material book, covering all the 19 topics written by the resource person was prepared and distributed to the participants.

An Evaluation form was circulated among the participants at the end of the workshop and it was observed that all the participants unanimously remarked that the course was highly beneficial to them and they could learn a lot from it. They also wanted that such courses should be repeated often in different places and possibly on different topics.

Such short term courses in various aspects of statistical and research methods commonly applied for the design of research projects and analysis of data pertaining to medicine, biology and public health were held in KMC, Manipal

and PSG college in Coimbatore and regular short term courses are regularly held in CMC Vellore. Feedback from these courses indicates that all of them were / are well accepted by the participants and highly successful.

The importance and requirement of biostatistics in health science teaching and research has been increasing day by day. Availability in quality and quantity manpower is an important issue. In order to generate good quality manpower, it is imperative to conduct appropriate training/ continuing education programmes. At two levels we should initiate these trainings. One level, to increase the knowledge and skills in biostatistical methods of health science professionals and the other level, continually to improve the quality of available biostatisticians. ISMS can take this challenge through initiating training/continuing education programme.

Objectives of these training programmes

1. To develop quality manpower in biostatistics-capacity building
2. To enhance knowledge and skills of health science researchers in applying appropriate statistical methods and research designs in their research work
3. To motivate young researchers in health science to appreciate the utility of appropriate statistical methods.
4. To meet biostatistics training needs of industry

Target group of trainees

1. Health science undergraduates
2. Health science postgraduates
3. Health science faculty and researchers
4. Biostatistics professionals
5. Biostatistics teachers
6. Biostatistics postgraduates
7. Statistics postgraduates
8. Statisticians and other professionals from industry

Levels of training

1. Basic
2. Middle
3. Advance

Since ISMS has grown very fast over a period of time and has a membership of about 1000 spread over all parts of our country, such short term courses, workshops and seminars should ideally planned and organized under the banner of ISMS. However, the Society should take appropriate steps in terms of identification of Institutions, Experts and most importantly the required finance for conducting such courses and workshops. Though a part of the finance can come from the course fee from the participants, it will be inadequate to conduct such events. ISMS should earmark a certain amount for this purpose. Suggestion of the President of ISMS on this matter is worthwhile to note. Regional events could be planned which might be financially viable and acceptable.

Besides giving proper & updated training to the in-service statisticians through short & long – term courses as mentioned above, reviewing the existing teaching pattern and related issues in the Medical Colleges is also very important in enhancing the status of Biostatistics in medical & health education & research institutions.

Recommendations

1. Continue to Organize one or two days' pre – Conference Workshop along with the ISMS Conference, each year
2. Separate courses should be arranged for statisticians and medical personnel
3. Identify training requirement for each group of trainees. This can be achieved through surveys/ debates and focus groups. ISMS can initiate this during the conference as well as can have this information through various modes. Our contacts and electronic networking should be well utilized for this purpose. This process should provide a set of core topics where training is required.
4. For assigning the banner of ISMS to each or at least some of the courses, financial assistance is an important and essential requirement. This should be considered by the Executive Committee and General body favorably.
5. Once training topics have been identified, we should concentrate on identification of trainers. Trainers should spread across the country. Trainers should be a mixture from academic, industry and research organizations. Software professionals also should be included in the trainers list.
6. ISMS in coordination with various members and organizations should consolidate resources in terms of funding, training facilities and ideal training locations which minimizes the cost for participants and organizations. Given below is a list of possible Institutions and Organizers of training courses:-

Institution	**Principal organizer**
South Region	
CMC Vellore	Prof. Jeyaseelan
NIMHANS	Prof. Subbakrishna
KMC, Manipal	Prof. Sreekumaran Nair
PSG college, Coimbatore	Prof. Anil Mathew
AIMS. Kochi	Prof. K.R. Sundaram
North Region	
NIMS, ICMR, New Delhi	Prof. Arvind Pandey
AIIMS, New Delhi	Prof. R.M. Pandey &
	Dr. S.N. Dwivedi
UCMS, Delhi	Prof. Abhaya Indrayan
SGPGI, Lucknow	Prof. C.M. Pandey
MLB Medical College, Jhansi	Prof. B.L. Verma
West Region & East Region (To be identified)	

The above is only a tentative list. More Institutions and Experts should be identified at different Regions and regular training courses/workshops should be conducted at different locations every year.

III. Research:

Proposal for Research in Medical Statistics Methodologies

Biostatistics or medical statistics has two related components. One is the development of statistical

methods to deal with problems arising out of health and diseases. The other is their application in medical research potential of which is yet to be fully exploited.

Biostatisticians or Medical statisticians in India have been performing multiple tasks like teaching even if in a limited way, assisting /helping the medical fraternity in the data analysis, and some also take up research mainly on their own volition. Few who are employed in Universities have been guiding doctoral students. The kind of research activity is by and large confined to statistical methodology, epidemiology and demography even though in certain centers like Indian Statistical Institute, research in the area of Genetic Statistics has been taking place. In order to encourage research in the area of medical statistics, primarily what has to happen is to define the role of medical statistician in this country, suitably train, equip and motivate the individual to take up research activity. This is the first task that has to be taken up. After this is achieved, the next task could be to identify relevant areas of research. Statistical methodology is being developed at a rapid pace. However, practical evaluation and tools for application of these methods lag behind though the software industry has caught up with the theoretical developments. There is a pressing need to compile and evaluate existing and developing methodologies, especially in the context of optimal study design and sample size. The resulting study design information would allow development of complementary methods for analyzing **rich**, medical, epidemiological and genetic databases. Biostatisticians have to collaborate with clinical faculty in the design, conduct and analysis of clinical research. Current statistical research interests in the area of clinical trials include randomly repeated measures modeling, meta-analysis, dose-response analysis, multiple testing, correlated categorical data modeling, evaluation of diagnostic tests, and statistical genetics. Topics in outcomes research include development of decision models for seriously ill patients, assessment instruments for patients with stroke and severe head injury, and performance profiles of healthcare providers, hospitals, and payers.

Causal modeling is an area though considered to be a contribution from statisticians working with observational data; it can be employed for experimental data as well. This method incorporates the exploratory factor analysis, confirmatory factor analysis, psychometric approach, econometric models and path coefficients analysis. Medical research workers have not exploited this method as is done in sociological and psychological research. This method has enormous scope for application and development. There are many areas, which require investigation such as sample size determination, identification problem, multi co-linearity etc.

Latent Class Analysis (LCA) is a statistical method for finding subtypes of related cases (latent classes) from multivariate categorical data. For example, it can be used to find distinct diagnostic categories given presence/absence of several symptoms, types of outcome groups, etc. The results of LCA can also be used to classify cases to their most likely latent class. LCA is used in way analogous to cluster analysis or Q

technique in Factor Analysis. That is, given a sample of cases measured on several variables, one wishes to know if there are a small number of basic groups into which cases fall. LCA is suitable for binary, ordered-category and Likert-scale, or nominal data. It is not used with purely ordinal (rank order) data. A version of LCA suitable for continuous variables is called latent profile analysis

All along, linear methods of Statistics and Mathematics are popularly used for the analysis of medical data. However, this data particularly from neuropsychiatric research may not be amenable to linear modeling and of late it is felt non linear models might give better results in outcome and prognostic research. Theoretical and clinical researchers of late talk of Chaos Theory and feel that adopting linear methods of computation and drawing conclusions on the dynamic human physiological system is wholly inappropriate and that is the reason for poor prediction and suggest the use of nonlinear methods. This has to be explored in greater depth.

Another area, which has not been exploited, is the **clinical database**. There are projects funded by ICMR, DST, CSIR, and UGC and even by agencies from abroad. Many research projects are carried out without support from any funding agencies. Some of the funded projects are conducted in one institution while others are in multiple centers. These data have not been utilized fully. There are potential users of these data if it is available to them. There is a need for national level database at least for major disease conditions, which could be accessed by users through Internet.

The scientists in the west believe that a country like India is more suitable to study the **natural course of any illness** and particularly of chronic illness like cancer, mental disorder including mental retardation, epilepsy, leprosy, etc. as there seem to be many cases in the community particularly, in rural areas without treatment. Whether this is true or not, the natural course of any illness can be studied and analyzed only when we have longitudinal studies. Database from such studies are necessary to apply some of our potential methods like survival analysis. Though many surveys on prevalence and incidence have been conducted and reported also. There is a need to combine these results, which have been arrived at over the years in many parts of our country using Meta analytical studies.

Data on national health and epidemiology are often collected using complex probability sample designs involving stratification and clustering of units. Pursuit into the designs that combine information from samples and administrative sources, and robust analytical methods based on models that improve on standard design-based inferences, and deal with problems of missing data may be worthwhile.

Bayesian Statistics

An essential tool for Bayesian modeling is Markov Chain Monte Carlo (MCMC). This computationally intensive simulation procedure is used to characterize complex high-dimensional posterior distributions. Bayesian modeling and analysis has played an ever-increasing role in the health sciences and public health. In image analysis, new Bayesian models for spatial

processes might enable researchers to match anatomically similar regions across image data sets. These methods facilitate statistical analyses of image data across patients. They also promise important diagnostic benefit through quantitative measurements of disease progression over longitudinally-matched image data. Ordinal and rank data are common in public health, and Bayesian methods allow such data collected from multiple raters to be combined, and permit the study of rater attributes. Recent advances in medical imaging technology allow the measure of brain activity of the intact, living human brain. The statistical methods applied in this area are computationally intensive.

Computational Statistics

Today, nearly every statistical analysis is performed on a computer. Some methods are particularly dependent on intensive computing or custom software. For example, in functional magnetic resonance imaging (FMRI) data, a single dataset consists of 100 million elements. Custom software is necessitated by complex data structures or for graphical methods for exploring data. Another area of interest could be permutation or re-sampling methods, which allow inferences under weak assumptions, but require analyzing variations on the data thousands of times over.

Longitudinal and Correlated Data

Correlated data are common in many health science studies, where clustered, hierarchical and spatial data are frequently observed. A common feature of such data is that observations are correlated and statistical analysis requires taking such correlation into account. Examples of clustered data include longitudinal data, familial data, and analysis of multiple outcomes or recurrent events. Hierarchical data are common in multi-center clinical trials and community/school-based intervention studies, where correlation is due to several levels of clustering, such as schools and classes. Spatial data arise in disease mapping, ecology, environmental health and brain imaging, where data are correlated due to spatial proximity. Examples of possible research areas include random effects models, estimating equations, missing-data, multiple-outcomes, nonparametric /semi-parametric regression, measurement error models, and joint modeling survival and longitudinal outcomes.

Statistical Analysis with Missing Data

Empirical studies in the social, behavioral, economic, and medical sciences frequently suffer from missing data. For instance, sample surveys often have some individuals who either refuse to participate or do not supply answers to certain questions, and panel surveys or longitudinal studies often have incomplete data due to attrition. Simple approaches to handling the missing data, such as discarding incomplete cases or filling in estimates of the missing values, often yield biased or inefficient statistical inferences. Developing better methods for analyzing missing data, using models for the data and missing data mechanism, and using computational tools such as the EM algorithm and the Gibbs' sampler would offset the research lacunae.

Survival Analysis

In many medical and scientific studies, investigators are interested in analyzing data on

time to an event. In such event history data, interest centers on the timing and occurrence of various kinds of events such as repeated infections, recurrences of disease, or sequences of events that occur through the study period. Further generalizations of these problems include issues of competing risks, complex sampling and censoring mechanisms, and incorporation of time-dependent or longitudinal covariates and this area needs to be exploited. Nonparametric methods are widely used in biomedical research. For example, log rank tests and Kaplan-Meier estimates are standard tools in analyzing censored survival data. Other research areas could be developing strategies for reducing or eliminating bias due to informative censoring, gaining information from auxiliary variables

Bioinformatics

Biomedical research, an information-based discipline, is undergoing a major revolution as novel experimental approaches are yielding unprecedented amounts of data. Automation and robotics are becoming integral parts of experimental processes, impacting the way academic and industrial research is carried out. Experimental biology and medicine are becoming increasingly dependent on the extensive application of statistics information sciences. Bioinformatics, the interdisciplinary field at the intersection of life and quantitative sciences, provides the necessary tools and resources for this endeavor. Modern fundamental and applied research in the life sciences is critically dependent on this relatively new discipline.

Cancer

A large number of research projects on cancer are increasingly being taken up. Developing statistical methodology for this is challenging and is another need. Analysis of epidemiologic data from a population based study of analysis of animal and human brain magnetic resonance imaging data to obtain early indications of the response to chemotherapy; and analysis of biomarkers for the early detection of cancer. Statistical methodology development is an integral part of these projects, examples of this are the development of methods for the analysis of microarray data, developing methods to combine biomarkers, developing more efficient designs for phase I clinical trials, developing methods for evaluating surrogate endpoints, missing data problems and developing joint models for longitudinal and survival data.

Clinical Trials

India has become the hub of clinical trial activity. Clinical trial research involves the study of novel therapies in patients with the purpose of identifying the best possible treatment for future use. developing newer statistical methodology that identify promising therapies more quickly and less expensively in the design, conduct, and analysis of single and multi-center clinical trials in cancer, heart disease, diabetes, hepatitis and neuropsychiatric disorders as well as trials in sleep disorders, women's and neonatal health and in the treatment of drug abuse.

Growth & Development and Nutritional Epidemiology of Children

Modeling in Growth and Development of children is an area where there is lot of scope for research by Biostatisticians. In spite of numerous studies on Growth and Development of children we don`t have a proper reference standard in anthropometric measurements and other growth parameters which can be referred and compared .Nation-wide study was conducted on Growth and Development of children for this purpose by Indian Council of Medical research almost half century ago. It is high time now to repeat this study with a proper study design and sample size.

Protein energy malnutrition (PEM) in children is a serious problem in our country. More reliable and scientifically and statistically acceptable methods for the classification of malnutrition in children should be developed for different sections of population in our country.

Nutritional Epidemiology which is the study of Diet, Diseases and Population is an area where not much work has been conducted in our country. There is lot of scope for the development appropriate models for suitable applications in Nutritional Epidemiology.

Laboratory sciences: A large amount of data is generated from laboratory investigations across the country. With the accreditation standards most of the laboratories follow uniform data that is available across different illness. Even though multivariate reference ranges, ROC curve methodology etc is known they have to be properly applied and used.

Problems in **health care economics** and the impact of these problems on public policy and medical guidelines need to be addressed. Examining the theoretical foundations of cost-effectiveness analysis, including such issues as measuring the effectiveness of interventions that have an influence on two closely linked individuals, more precisely modeling quality adjusted life years gained over time and the role risk attitudes play in assessing the effectiveness of health care interventions would yield robust and valuable information for developing national strategies.

Statistical Genetics: Statistical genetics is the development of models and methods for the analysis and interpretation of genetic data observed at any level from the cell nucleus to the species. With the identification of new genetic markers, the study of genetic variation at the DNA level is made possible. The advances in biotechnology has also made large-scale DNA sequencing feasible, leading to the Human Genome Project -- the endeavor to sequence the entire human genome. The phase II of the Human Genome Project has two major components. One is the discovery of the relationships between DNA sequence and gene function; this is the estimation of effects. The other involves the study and understanding of the genetic variation within and among individuals, populations, and species; this is analysis of variance. Both these goals are statistical, and fall within the realm of Statistical Genetics. The statistical approaches used in this area are computationally intensive. One area of research of special interest is at the interface of molecular technology and population studies. Within the next few years, molecular

genetics methods will provide the ability to genotype large numbers of people for a large number of DNA markers, including single nucleotide polymorphisms (SNPs) and raw DNA sequences. Statistical methods to use this information in genetic studies are needed. These methods will need to work in concert with rapidly developing bio informatics tools. Evaluation of study designs and data collection methods will also be required as molecular genetics technology advances are incorporated into population studies of human disease and biological variation.

As the disease targets of human genetic study become more complex, the analysis of the data also becomes more complex. One of the pressing challenges in the analysis of the genetics of complex disease is the analysis of a large variety of demographic and clinical data describing the disease. Better methods to describe clinical epidemiological variation with respect to genetic variation are needed. Development of statistical methods and population databases translating results from genetic studies in families and populations to individuals will be necessary if the promise of genetic medicine and pharmacogenetics is to be realized.

HIV Aids: The amount of attention and recognition this area is being given automatically should prompt us to take up research activity pertaining to this. Number of centers and researchers has been working on it. However, outcome research and statistical modeling the sequence to outcome have to be taken up. Development of prognostic models and their validation could be one challenging area of research.

The areas of artificial neural net works, Capture recapture modeling, Classification and regression trees, Log linear modeling, qualitative data analytic models, pattern recognition and other Fuzzy methods of data classification have not been exploited to their potential. Similarly the methods of Item response theory in the construction of scales, conjoint analysis, and multinomial logistic regression have to be appropriately explored.

There seem to be a rich and diverse potential for statistical applications and research in our country but need of the hour seems to be in motivating people to take up these challenges.

Recommendations

(1) Interested and experienced statisticians should be encouraged to apply for research projects in specific fields, as outlined in the proposal.

(2) They may be provided with some seed money from ISMS to carry out preliminary studies in the area of their interest. This will generate some useful results based on which they can apply for research projects from the financial Institutions

(3) Collaborative research projects should be planned with the help of interested clinicians and researchers in pre and para-medical areas with financial support from agencies like the ICMR, UNICEF, DST, DBT and WHO India, etc

(4) To start with, 3 or 4 areas may be selected from the list of areas outlined in the proposal

and experts in these areas should be identified and they should be requested for submitting research proposals either by themselves or by the young statisticians under their guidance.

(5) Following areas may be considered for research initially:

Sl. No.	Area	Experts
1	Models in Psychiatry & Clinical Psychology	Prof. Subbakrishna Prof. V. G. Kaliaperumal
2	Growth, Development & Malnutrition	Prof. K. R. Sundaram Dr. K. Visweswara Rao
3	Survival analysis	Dr. V. Sreenivas
4	Meta analysis	Prof. Sreekumaran Nair
5	HIV models	Prof. Arvind Pandey Prof. B. L. Verma
6	Bio-informatics	Prof. Abhaya Indrayan Dr. P. Venkatesan
7	Bayesian Statistics	Dr. Geetha Menon

Appeal 3

The recommendations of the ISMS "Silver Jubilee Committee" and "Core Committee on Education, Training and Research" are published in accordance with the decisions taken after detailed discussions held during the Conferences at Chennai and Ludhiana (EC & GB). Esteemed members of the Society and the Office bearers are requested to forward their valuable comments to the President of ISMS with Copies to Chairmen and Member Secretaries of the respective Committees.

Members may be please also forward a copy to the official e-Mail address of ISMS bulletin.

e-Mail: ismsbulletin2013@gmail.com

Annual National Conferences of ISMS (1983–2012)

Year	Host Institution	President	General Secretary	Treasurer	Organising Secretary
1983	M L B Medical College, Jhansi	Prof. R.N. Srivastava	Dr. B. L. Verma	Dr. G. D. Shukla	Dr. B. L. Verma
1984	K G Medical College, Lucknow	Prof. R.N. Srivastava	Dr. B. L. Verma	Dr. G. D. Shukla	Dr. Vidya Bhusan
1985	I S I, Kolkata	Prof. R.N. Srivastava	Dr. B. L. Verma	Dr. G. D. Shukla	Prof. T. Krishnan
1986	NIMHANS, Bangalore	Prof. R.N. Srivastava	Dr. B. L. Verma	Dr. G. D. Shukla	Prof. V. G. Kaliaperumal
1987	Govt. Medical College, Srinagar	Prof. R.N. Srivastava	Dr. B. L. Verma	Dr. G. D. Shukla	Dr. M. L. Zulshi
1988	N I N, ICMR Hyderabad	Prof. R.N. Srivastava	Dr. B. L. Verma	Dr. G. D. Shukla	Dr. K. Visweswara Rao
1989	Institute of Medical Science, BHU Varanasi	Prof. P. V. Sukhatme	Dr. Padma Singh	Dr. I.M.S. Lamba	Dr. R.N. Mishra
1990	C M C, Vellore	Prof. P. S. S. Sunder Rao	Dr. Padma Singh	Dr. I.M.S. Lamba	Dr. J. Richard
1991	IRMS, ICMR & AIIMS, New Delhi	Dr. S. Radhakrishna	Dr. Padma Singh	Dr. I.M.S. Lamba	Dr. Padma Singh
1992	I I P S, Mumbai	Dr. K. B Pathak	Dr. Padma Singh	Dr. I.M.S. Lamba	Dr. C. P Prakasam
1993	Andhra University, Visakhapatnam	Prof. Rameshwar Sharma	Prof. K. R. Sundaram	Dr. S. N. Diwedi	Prof. K.V. Suryanarayana
1994	MGIMS, Sevagram Wardha, Maharastra	Prof. K. Srenivasan	Prof. K. R. Sundaram	Dr. S. N. Diwedi	Prof. N. K. Tyagi
1995	IRMS (ICMR), Chennai	Prof. P. S. S. Sunder Rao	Prof. K. R. Sundaram	Dr. S. N. Diwedi	Dr. M. Kachirayana
1996	AFMC, Pune	Prof. P. S. S. Sunder Rao	Dr. M. Kachirayana	Mr. R. Jayabal	Dr. S.S. Ganguly
1997	S M S Medical College, Jaipur	Prof. P. P. Talwar	Dr. M. Kachirayana	Mr. R. Jayabal	Prof. M.P. Songara
1998	C M C, Vellore	Prof. P. P. Talwar	Dr. M. Kachirayana	Mr. R. Jayabal	Dr. L. Jeyaseelan
1999	NIMHANS, Bangalore	Prof. V. G. Kaliaperumal	Dr. I. M. S. Lamba	Dr. R. J. Yadav	Dr. D. K. Subbakrishna
2000	C J I L, JALMA, Agra	Prof V. G. Kaliaperumal	Dr. I. M. S. Lamba	Dr. R. J. Yadav	Dr. Anil Kumar
2001	SGPGIMS, Lucknow	Dr. Padma Singh	Dr. I. M. S. Lamba	Dr. R. J. Yadav	Dr. C. M. Pandey

Year	Host Institution	President	General Secretary	Treasurer	Organising Secretary
2002	IRMS, New Delhi	Dr. Padma Singh	Dr. C. M. Pandey	Dr. Uttam Singh	Prof. Arvind Pandy
2003	DMRC, Jodhpur	Prof. K. R. Sundaram	Dr. C. M. Pandey	Dr. Uttam Singh	Dr. R. C. Sharma
2004	JIPMER, Pondicherry	Prof. K. R. Sundaram	Dr. C. M. Pandey	Dr. Uttam Singh	Prof. Ajit Sahai
2005	J N Medical College, Belgaum	Dr. Babu L Verma	Dr. R. Venkatesan	Dr. V. S. Yadav	Prof. Shivaprasad Goudar
2006	P S G IMSR, Coimbatore	Dr. Babu L Verma	Dr. R. Venkatesan	Dr. V. S. Yadav	Prof. Anil C Mathew
2007	Manipal University, Manipal	Dr. Ajit Sahai	Dr. R. Venkatesan	Dr. V. S. Yadav	Prof. N. Sreekumaran Nair
2008	C S U Lucknow/Nainital	Dr. Ajit Sahai	Dr. R. Venkatesan	Dr. V. Selvaraj	Prof. V. K. Srivastava
2009	BHU, Varanasi	Dr. Arvind Pandy	Dr. R. Venkatesan	Dr. V. Selvaraj	Prof. R. N. Mishra
2010	NIMS/NIHFW, New Delhi	Dr. Arvind Pandy	Dr. R. Venkatesan	Dr. V. Selvaraj	Dr. R. J. Yadav
2011	NIRT, TRC Chennai	Prof. T. Krishnan	Dr. R.J. Yadav	Dr. Sharad K Mathur	Dr. R. Venkatesan
2012	DMCH, Ludhiana	Prof. T. Krishnan	Dr. R.J. Yadav	Dr. Sharad K Mathur	Prof. R.K. Soni

Appeal 4

Esteemed members of the Society and the Office bearers are requested to send year-wise details, if available, of the Awardees and also the information with regard to the year of institution of the Awards, as listed hear under;

- Prof. B.G. Prasad Award
- Smt. Suraj Kali Jain Award
- Prof. P.V. Sukhatme Award
- Prof. S.K. Bhattacharya Oration Award
- Dr. R.N. Srivastava Award
- Prof. P.P. Talwar Shield
- Indrayan Travel Grant

The information may please be forwarded to the official e-Mail address of ISMS bulletin.

e-Mail: ismsbulletin2013@gmail.com

Fellows of the Society

Sl. No.	Fellowship
1	Prof. S. Biswas
2	Prof. A. Indrayan
3	Prof. V. G. Kaliaperumal
4	Prof. S. Krishnamurthy
5	Dr. Sushila Nayar
6	Prof. Arvind Pandey
7	Prof. K.B. Pathak
8	Prof. G.P. Patil
9	Prof. B.G. Prasad
10	Dr. S. Radhakrishna
11	Prof. C. R. Rao
12	Prof. P.S.S. Sundar Rao
13	Dr. K. Visweswara Rao
14	Prof. K. Ramachandran
15	Prof. J. Richard
16	Prof. J. S. Rustogi
17	Prof. Rameshwar Sharma
18	Dr. Padam Singh
19	Prof. K. Srinivasan
20	Prof. R. N. Srivastava
21	Prof. C. M. Suchindran
22	Prof. P.V. Sukhatme
23	Prof. K.R. Sundaram

Sl. No.	Fellowship
24	Prof. P.P. Talwar
25	Prof. B. L. Verma *
26	Prof. S. N. Dwivedi (2003)
27	Prof. R. N. Mishra (2003)
28	Prof. Ajit Sahai (2004)
29	Prof. D. K. Subbakrishna (2004)
30	Prof. R. M. Pandey (2005)
31	Dr. P. Venkatessan (2005)
32	Dr. N. S. Murthy (2006)
33	Dr. Anil Kumar (2006)
34	Prof. L. Jeyaseelan (2007)
35	Dr. R. J. Yadav (2007)
36	Prof. T. Krishnan (2008)
37	Prof. B. Antonisamy (2008)
38	Prof. V. K. Srivastava (2009)
39	Prof. C. M. Pandey (2009)
40	Prof. G.D. Shukla (2010)
41	Prof. Deoki Nandan (2010)
42	Prof. D. C. Nath (2010)
43	Dr. Rakesh Shukla (2011)
44	Dr. L. Sathiyanarayana (2011)
45	Prof. N.K. Tyagi (2012)
46	Dr. Abha Rani Aggarwal (2012)

* Till Serial No. 25 the fellows of the Society listed in alphabetical order. The information on year of fellowship awards is solicited from office bearers and the members of Society.

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1	1	1	December	1986	Available	Hard Copy
2	2	1	June	1987	Missing	Hard Copy
3	2	2	December	1987	Available	Hard Copy
4	3	1 & 2	June & December	1988	Available	Hard Copy
5	4	1	June	1989	Available	Hard Copy
6	4	2	December	1989	Available	Hard Copy
7	5	1	June	1990	Available	Hard Copy
8	5	2	December	1990	Available	Hard Copy
9	6	1	June	1991	Available	Hard Copy
10	6	2	December	1991	Available	Hard Copy
11	7	1	June	1992	Missing	Hard Copy
12	7	2	December	1992	Available	Hard Copy
13	8	1	June	1993	Available	Hard Copy
14	8	2	December	1993	Available	Hard Copy
15	9	1	June	1994	Available	Hard Copy
16	9	2	December	1994	Available	Hard Copy
17	10	1	March	1995	Missing	Hard Copy
18	10	2	September	1995	Available	Hard Copy
19	11	1	March	1996	Available	Hard Copy
20	11	2	September	1996	Available	Hard Copy
21	12	1	March	1997	Missing	Hard Copy
22	12	2	September	1997	Available	Hard Copy
23	13	1	March	1998	Available	Hard Copy
24	13	2	September	1998	Available	Hard Copy
25	14	1	June	1999	Missing	Hard Copy
26	14	2	December	1999	Missing	Hard Copy

Sl. No.	Volume	Issue	Month	Year	Status	Mode of Publishing
27	15	1	June	2000	Available	Hard Copy
28	15	2	December	2000	Available	Hard Copy
29	16	1 & 2	June & December	2001	Available	Hard Copy
30	17	1	June	2001	*	*
31	17	2	December	2001	*	*
32	18	1	June	2002	Missing	Hard Copy
33	18	2	December	2002	Missing	Hard Copy
34	19	1	June	2003	Missing	Hard Copy
35	19	2	December	2003	Missing	Hard Copy
36	20	1	June	2004	Missing	Hard Copy
37	20	2	December	2004	Missing	Hard Copy
38	21	1	June	2005	Missing	Hard Copy
39	21	2	December	2005	Missing	Hard Copy
40	22	1	June	2006	Available	Online Publication
41	22	2	December	2006	Missing	Online Publication
42	23	1	June	2007	Missing	Online Publication
43	23	2	December	2007	Missing	Online Publication
44	24	1	July	2008	Available	Online Publication
45	24	2	December	2008	Missing	Online Publication
46	25	1	June	2009	Missing	Online Publication
47	25	2	December	2009	Missing	Online Publication
48	26	1	July	2010	Available	Online Publication
49	26	2	December	2010	Missing	Online Publication
50	27	1	March	2011	Missing	Online Publication
51	27	2	September	2011	Available	Online Publication
52	27	1	March	2012	missing	Online Publication
53	27	2	September	2012	missing	Online Publication
54	28	1	March	2013	Missing	Online Publication

* The Volume 16 and 17 got mixed-up or by mistake the volume 16 was numbered as 17.