WHO/WKC/Tech.Ser./03.5

WORLD HEALTH ORGANIZATION
CENTRE FOR HEALTH DEVELOPMENT
KOBE, JAPAN

# WOMEN AND HEALTH

Proceedings of International Symposium on Gender-Sensitive Medicine
Chiba Prefecture, Japan, 1 March 2003

WHO Kobe Centre
2003

# TABLE OF CONTENTS

# Preface

This report presents the findings of a project completed as part of the implementation of the Kobe Plan of Action for Women and Health issued in April 2002 at the Third International Meeting on Women and Health organized by the WHO Centre for Health Development (WHO Kobe Centre – WKC), Kobe, Japan. The Plan of Action can be accessed at: http://www.who.or.jp/women/research/kobe_recommendation.html.

Four voluntary Task Forces were established to implement the Plan of Action. The 50 members from 18 countries have worked in four priority areas: (1) Comparative analysis of gender equity/equality indicators; (2) Use of gender analysis; (3) Women's leadership in health; (4) Enhancing research transfer on specific gender equity and health issues.

Task Force 4 was set up to address the latter priority area by conducting "smaller meetings/workshops to bring researchers and policy-makers together to consider specific gender equity issues". On 1 March 2003 the International Symposium on Gender-Sensitive Medicine took place in Chiba Prefecture, Japan. The Symposium considered gender-sensitive practices in women's clinics. The presentations covered various ways of implementing a gender-sensitive approach and reflected concern that insufficient attention was being given to the gender-specific aspects of health determinants. The participants defined the notion of a gender-sensitive approach and concluded that gender-sensitive medicine was part of an ensemble of practices comprising a gender-sensitive approach to health and health care. Such an approach requires understanding of the ways in which the combination of factors that shape men's and women's lives (e.g. biological sex and wide-ranging social practices) produce inequities in their health outcomes. Fifteen strategies for addressing and redressing gender inequities in health outcomes were proposed.

I feel confident that this report will be a valuable reference for researchers and policy-makers and that it will provide a sound basis for policy formulation and programme development.

Yuji Kawaguchi, M.D., Ph.D.
Director
WHO Centre for Health Development

# EXECUTIVE SUMMARY AND CONCLUSIONS

# Executive summary

**Dr Toni Schofield**
Senior Lecturer
School of Behavioural and Community Health Sciences
Faculty of Health Sciences
University of Sydney
Australia

## Background

This executive summary of the International Symposium on Gender-Sensitive Medicine, organized by the WHO Centre for Health Development (WHO Kobe Centre – WKC) in Chiba Prefecture, Japan, on 1 March 2003, is based on material derived from the preparation, documentation, programme of work, deliberations and conclusions of the Symposium.

The Symposium followed the Centre's three International Meetings on Women and Health held on Awaji Island, Hyogo Prefecture, Japan (April 2000), in Canberra, Australia (April 2001) and in Kobe, Japan (April 2002). The latter meeting endorsed the Kobe Plan of Action for Women and Health which is being taken forward by four Task Forces, one of which was responsible for the organization of the Symposium.

The purposes of the Symposium were:

- to exchange research outcomes on gender-sensitive medicine which identify a range of issues related to women, gender and health;
- to identify strategies for addressing the issues raised;
- to draw conclusions and articulate action-oriented strategies based on the presentations and discussions.

The programme of the Symposium is attached (Annex 2).

There were 100 participants from six countries in different regions of the world (Annex 3).

The highly interactive nature of the meeting was greatly appreciated by the participants. Some 50 questions were put to the Governor of Chiba Prefecture, the Director of WKC and the expert presenters.

At the opening ceremony, Dr Yuji Kawaguchi, Director of WKC, and Ms Akiko Domoto, Governor of Chiba Prefecture, welcomed the participants and explained the policy contexts of the presentations and discussions. Dr Kawaguchi outlined recent international developments in which WHO and WKC were involved in formulating and promoting a gender-sensitive approach to health. Governor Domoto spoke of her commitment to such an approach and of the political challenges in developing health services that could advance women's health in Japan.

The Symposium comprised three plenary sessions with eight presentations and a short discussion at the end of each session, followed by a fourth plenary session for general discussion and conclusions.

The following meeting officers were elected unanimously: Chairperson, Professor Yasuyoshi Ouchi, Reproductive, Developmental and Aging Science, Graduate School of Medicine, University of Tokyo; Co-Chairperson, Dr Keiko Amano, Director of Chiba Prefectural Institute of Public Health; Moderators: Professor Yasuyoshi Saito, Department of Clinical Cell Biology, Graduate School of Medicine, Chiba University; Professor Masako Matsuda, Faculty of Health Sciences, Yamaguchi University School of Medicine; Dr Chuwa Tei, Professor of First Department of Internal Medicine, Kagoshima University Faculty of Medicine; Rapporteurs: Dr Toni Schofield, Senior Lecturer, School of Behavioural and Community Health Sciences, Faculty of Health Sciences, University of Sydney; Dr Aizan Hirai, Director, Togane Hospital, Chiba Prefecture.

With Professor Yasuyoshi Ouchi presiding, the Agenda and Provisional Programme were formally adopted.

In Session 1, Dr Marianne J. Legato of Columbia University, United States of America, and Professor Jill Astbury of Melbourne University, Australia, discussed foundations for building a gender-sensitive approach to health and health care. Dr Legato considered that the inclusion of women alongside men in biomedical research, both as researchers and research subjects, was a fundamental requirement. Professor Astbury proposed that gender-sensitive health policy, research and clinical practice depended on ensuring that evidence of good quality, the protection of human rights and the role of gender were fully addressed and incorporated.

Session 2 was concerned with recent gender-sensitive research into biological function and disease. Dr Hiroaki Kawano, a cardiovascular specialist at Kumamoto University School of Medicine, Japan, presented results of his research on the clinical features of women with variant angina pectoris. Dr William Byne of Mount Sinai School of Medicine, USA, explored the relationship between identified biological differences in the brains of males and females and serious illnesses, especially in relation to mental health.

Session 3 focused on the various dimensions involved in implementing a gender-sensitive approach in health care. Dr Anna Westerståhl of Göteborg University, Kingdom of Sweden, discussed the significance of emotions in the teaching and learning involved in educating medical students about gender and how it operated in clinical encounters. Professor Sharon Fonn of University of the Witwatersrand, Republic of South Africa, stressed the importance of adopting a gender relations approach to understanding health and illness, especially with regard to sexually transmitted diseases, and described the approach she had developed in creating gender awareness among medical students. Dr Keiko Amano of Chiba Prefectural Institute of Public Health summarized pioneering work on the establishment of women's health services in Chiba and its impact elsewhere in Japan. Ms Kimie Iwata of Japan's Ministry of Health, Labour and Welfare, reported on the progress of a gender-sensitive approach to health and welfare in government decision-making and considered that it could make a significant contribution to the health and welfare of both men and women.

In Session 4, written questions selected by the chairpersons were put to the presenters and open discussion ensued. This was followed by a presentation of draft conclusions arising from the deliberations of the Symposium.

The conclusions were endorsed at the end of the Symposium and were subsequently referred to WKC Task Force 4 to be pursued as part of the Kobe Plan of Action for Women and Health. It is intended to report progress to the Fourth International Meeting on Women and Health in Tanzania towards the end of 2003.

# Conclusions

## Preamble

Organized by the WHO Centre for Health Development (WHO Kobe Centre – WKC) as part of its implementation of the Kobe Plan of Action for Women and Health (2002), building on the 2000 Awaji Statement and the 2001 Canberra Communiqué, the Symposium was a response to the 1998 WHO policy document *Health for all in the 21st century* and one of its four key requirements, namely the incorporation of a gender perspective into health policies and strategies. WKC actively supports this policy by integrating a gender perspective into its work on the development of health and welfare systems and through the related activities of the WKC Women and Health Programme.

***

The Symposium reaffirmed that women's health was a human right and that gender-sensitive medicine was an essential part of a gender-sensitive approach to health and health care. This approach involved recognizing and understanding the ways in which the combination of factors that shape men's and women's lives, such as biological sex and wide-ranging social practices, produced inequitable health outcomes. Strategies for addressing and redressing gender inequities in health outcomes had to be based on a gender-sensitive approach.

1. The Symposium affirmed that the two most important dimensions in equitable health outcomes were health status and the performance of health systems. The presentations and discussions identified the following gender-sensitive strategies for improving both:
    - further development of health policy and research on the basis of an understanding of the relationships between sex, gender and health;
    - education of medical and health professionals about the relationships between sex, gender and health;
    - encouragement of collaboration and research and information exchange between mainstream health service organizations and women's health services.
2. The Symposium presentations and discussions identified the following gender-sensitive strategies for improving health status:
    - enhancement of women's access to economic, social and community resources, particularly in rural areas;
    - placing a value on women's unpaid and caring work;
    - encouragement of shared decision-making by men and women on issues such as contraception and household management;
    - advocating recognition by scientific and medical communities that women are an invaluable source of health information;

- encouragement of health-care-seeking behaviour through a range of measures, including the dissemination of information and the heightening of awareness.

3. The Symposium presentations and discussions identified the following gender-sensitive strategies for improving health systems performance:

   - democratization of decision-making in health services by increasing women's representation on health service boards and committees;

   - removal of barriers impeding women's participation in research both as study subjects and investigators;

   - use of gender-specific protocols, where relevant, for the prevention, treatment and cure of disease;

   - encouragement of medical and health professionals to recognize the links between conditions such as violence and depression;

   - examination of the efficacy of holistic women's health services in responding to women's reported health concerns;

   - provision of incentives for women to enter and remain in the medical profession;

   - exploring whether women's health services can be a model for more coordinated, responsive and accountable health care systems.

# WELCOMING REMARKS AND MESSAGES

# Welcoming remarks

**Dr Yuji Kawaguchi**
Director
WHO Centre for Health Development

Ms Akiko Domoto, Governor of Chiba Prefecture, Japan, distinguished guests and experts, colleagues, ladies and gentlemen, it is my great pleasure to welcome you to the International Symposium on Gender-Sensitive Medicine, organized by the WHO Centre for Health Development, Kobe, Japan, known as the WHO Kobe Centre (WKC), in collaboration with Chiba Prefecture.

Today's Symposium represents the type of opportunity whereby WKC seeks to provide a platform where policy decision-makers and health-related experts can explore innovative ways of tackling priority health challenges. I am therefore very pleased that outstanding experts in gender-sensitive medicine and policy decision-makers have gathered here to discuss issues related to gender and health. In so doing, we are pursuing the important issues related to gender-sensitive medicine raised at WKC's Third International Meeting on Women and Health, held in Kobe in April 2002, and included in the Kobe Plan of Action for Women and Health.

For far too long, women's health has been largely assimilated into reproductive health and this has been accompanied by a gender-blind research approach to health. Ignoring the factor of gender in health-related research has resulted in biased research outcomes and an associated imbalance in treatment and services that do not respond to specific needs.

In order to overcome this situation it is necessary to adopt a constructive approach and explain the need for gender-sensitive medicine. Sound evidence is the foundation of WKC's work for people's health. With our partners we are striving to foster and coordinate the assessment of scientific issues in complex areas, reviewing new evidence as it becomes available and examining the policy implications. The scientific analysis of issues influencing people's health is central to our dialogue with policy decision-makers.

I am convinced that today's Symposium will further demonstrate the importance of developing and expanding a gender-sensitive approach to people's health. It will also serve to raise awareness of the different health needs of men and women by mainstreaming the major policy issues facing medical science and health systems.

I firmly believe that a more holistic approach to health should be adopted, taking all human values into account. It is on this basis that we are taking steps to improve women's health by bringing together more evidence, making it more widely available, improving links with partners and reviewing research results. Close working relations among WKC's partners ensure that relevant information, knowledge and experience can be shared and used more effectively. WKC's close collaboration with other partner institutions means that we are supporting good practices in various parts of the world through improved policies and programmes.

This Symposium is addressing one of the most critical aspects of medical science, that of gender-sensitive medicine for better health and quality of life. It is necessary to identify effective responses to men's and women's health needs. Although the focus today is on women's health, the scope of gender-sensitive medicine, of course, also covers men's health.

In line with WKC's policy, the Symposium is interdisciplinary and international, and the topics to be discussed go beyond clinical research to cover health service development and education. The programme (Annex 2) is divided into four sessions.

Firstly, an overall explanation of gender-sensitive medicine will be provided.

Secondly, there will be presentations of epidemiological research and findings to throw more light on identified major problems affecting women's health.

Thirdly, successful practices in the area of gender-sensitive medicine in Africa, Asia and Europe will be described. The implications of what has been learnt from these models of success will be highlighted, with reference to positive influences on the development of health and welfare systems, particularly for women. Special attention will be given to identifying patterns that are effective and on possible implications for change.

Fourthly, it is intended to arrive at action-oriented conclusions based on the presentations and discussions. This may involve highlighting models of success achieved in health and welfare systems in given settings, indicating lessons for reforms in the health sector and elsewhere, and delineating follow-up projects and collaborative partnerships.

WKC is well recognized globally for its accumulated stock of information and for the exchange of experiences relating to the overall development of health and welfare systems. We anticipate further progress through fruitful and sustained collaboration with you in this crucial area of gender-sensitive medicine.

I look forward to your presentations, discussions and conclusions. They will undoubtedly serve to guide future policy formulation and implementation with the overall objective of improving health and well-being, particularly of women.

May I therefore wish you an interesting and rewarding Symposium.

# Welcoming remarks

**Ms Akiko Domoto**
Governor
Chiba Prefecture
Japan

Ladies and gentlemen, welcome to Chiba Prefecture.

I am most grateful to Dr Kawaguchi, Director of the WHO Centre for Health Development (WHO Kobe Centre – WKC) for his efforts to hold this Symposium in Chiba.

As Governor of Chiba Prefecture, I would like to express my sincere thanks to Dr Marianne J. Legato, Professor of Clinical Medicine, Columbia University College of Physicians and Surgeons, United States of America and panellists from abroad as well as Japanese participants.

When Dr Legato visited Japan and gave a lecture in Makuhari, Chiba Prefecture, last year, I was strongly impressed to learn how far gender-specific medicine had progressed in the USA.

About half a century ago an American journalist became aware of the importance of women's health care. Moreover, female physicians in the USA who understood its significance initiated activities related to women's health in their communities, and this led to the promotion of a national policy in this field. Such activities, now ranging from university research to community activities, have made a deep impression on my mind.

Recently, Japanese doctors and researchers have started research activities related to gender-specific medicine. However, in contrast to what has happened in the USA, there has been no development at government level so far.

When the government policies and plans in the USA were described to us last year we were inspired to begin working on gender-specific medicine in cooperation with the Ministry of Health, Labour and Welfare. As Governor, I look forward to the development of policy in this field.

In April 2001, I took office as Governor of Chiba Prefecture and immediately undertook two projects related to women's health and medical care.

One of these included "Women's medical care and health promotion" in "Health Chiba 21", Chiba Prefecture's guidelines for health promotion policy from the viewpoint of women, especially with respect to gender.

The other, a first step in policy development, involved opening a women-only outpatient clinic in Togane Hospital, Chiba Prefecture, in September 2001, which was the first of its kind in a Japanese prefectural hospital.

I had no hesitation in undertaking these two projects. As a member of the Diet over a period of 12 years I had repeatedly proposed that the Government should comprehensively position women's health policy in terms not only of maternal and child health but also of women's health promotion throughout their lives.

The Japanese Government's health and welfare services focus on maternal and child health. Women's health has been perceived only as a matter of giving birth and raising children, and no comprehensive policies related to women's health have been implemented so far.

With respect to the Child Welfare Law enacted in 1947, the purpose was the sound upbringing of children. Women's health during pregnancy was just a secondary issue.

Moreover, the fundamental principle of the Maternal and Child Health Law enacted in 1965 is the maintenance/build-up of health in women and infants. Based on this law, a mother-and-baby notebook for medical and welfare records has been issued, which covers only preschool infants and their mothers. Women who do not have children, and women with diseases unrelated to pregnancy/childbirth, are not included, and thus women's health is not comprehensively guaranteed.

On the other hand, internationally, there have been moves to promote women's health and rights.

At the International Conference on Population and Development in Cairo in 1994, agreement was reached on women's health, rights and empowerment.

In 1995 at the Fourth World Conference on Women in Beijing, the right of women to enjoy sound mind and body physically, mentally and socially was agreed upon as "Women's health and rights", now recognized globally.

In spite of having accepted these international agreements, the Japanese Government did not revise "the Eugenic Protection Law" or "the Maternal and Child Health Law" to reflect them in domestic law.

I kept proposing that the government should enact a basic law on women's health, comprehensively guaranteeing women's health throughout their lives, instead of the Maternal and Child Health Law, which covers only a part of women's lives, i.e. motherhood, but my proposal was never accepted. Within the Ministry of Health, Labour and Welfare there is a Maternal and Child Health Division but no division for the health and welfare of women.

I then decided that, if the Government would not take the initiative in this field, I would do so in Chiba Prefecture.

Initially, one doctor took care of a women-only outpatient clinic in the Prefecture's Togane Hospital, which became so popular that patients had to wait several months for appointments. The number of doctors was therefore increased and the clinic was expanded.

Furthermore, in response to requests from women across the Prefecture for women's clinics in their communities, we took active measures to support hospitals other than prefectural ones. To date, women-only outpatient clinics have been opened in three prefectural hospitals and four public/private hospitals in Chiba Prefecture, and as of the end of January 2003 a total of more than 1000 women had visited these clinics.

In addition, since May 2002, 15 public health centres in the Prefecture have offered a women's health consultation service, provided by female doctors one to four times a month. This service has been very popular and more than 1000 women have already used it either by telephone or in person. The subjects of consultation range from menopausal symptoms to infertility and mental problems.

In order to collect basic data for the development of a gender-specific effective health and medical policy, it has been decided to conduct epidemiological surveys, including a survey on health conditions of people in Chiba Prefecture and a study on urgent health issues affecting women of the Prefecture.

The Chiba Prefectural Government is now a pioneer in the field of women's health care and has been interviewed by the media and visited by other prefectural governments. Because the Chiba Prefectural Government's approach to women's health care has been highly appreciated, women-only outpatient clinics have rapidly spread nationwide: as of January 2003 more than 30 hospitals in Japan had a women's clinic.

Despite the fact that, as a member of the Diet, I had made proposals in this field over a period of 12 years, it was not until the success of the women-only outpatient clinics in Chiba Prefecture that such clinics spread throughout the country within less than two years. This rapid spread suggests that many women had been feeling a great need for such provision.

Why has women's health care been so popular?

This has happened because, in the past, health care and government services did not meet women's needs. Only male subjects were included in clinical trials of drugs. Gender-specific comprehensive medical research on women was not conducted. Consequently, under current circumstances, women are not diagnosed or treated appropriately, wrong diagnoses are made or women are passed on to various hospital departments.

In addition, because of subdivision and advances in medical care, the importance of primary care and comprehensive health care has been forgotten.

It used to be said that the average life span was 50 years. However, the average life expectancy has increased by as much as 30 years, presenting us with the challenge of how to spend these extra years comfortably, sound in mind and body. It is important to improve the quality of life as well as to prolong the life span.

To this end our future task is to improve preventive measures, diagnostic techniques and treatments by analysing the results of clinical studies based on gender differences, with a view to providing both women and men with health and medical services of the highest possible quality. This, I think, will lead to improvements in the quality of life during these extra 30 years.

Let me conclude by expressing my heartfelt desire that the results of this Symposium be disseminated worldwide as well as nationwide, as a further step towards the international conference to be held in Tanzania in the autumn of 2003.

# Message

**Dr Taro Nakayama**
Member
House of Representatives
Japan

It is my great pleasure as Chairman of the Japanese Parliamentary Support Group to the WHO Centre for Health Development (WHO Kobe Centre – WKC) to extend warm congratulations to Dr Yuji Kawaguchi, Director of WKC, and all the distinguished participants in this International Symposium on Gender-Sensitive Medicine.

The increasing number of women's outpatient clinics in Japan has clearly demonstrated the value of an approach that is more responsive to the needs of women's health. Government health care policies and programmes should be capable of adapting to the different requirements of men and women. This can be achieved by introducing a gender perspective into health policies, programmes and strategies, whereby women's health issues are highlighted.

As Chairman of the Japanese Parliamentary Support Group, I feel sure that this Symposium will contribute to the promotion of women's health. Through research and the dissemination of information to professionals and the general public the adaptation of health care policies and systems to the health needs of both men and women can be improved.

WKC is a pioneer in this area and I have no doubt that the Symposium will be a milestone in women's health development.

May I wish you, Dr Kawaguchi, and all the participants, a very rewarding Symposium.

# Message

**Ms Mariko Bando**
Director-General
Gender Equality Bureau, Cabinet Office
Government of Japan

I would like to send my congratulations to the WHO Centre for Health Development (WHO Kobe Centre – WKC) and Chiba Prefecture on the occasion of this International Symposium on Gender-Sensitive Medicine. I believe that a knowledge of gender issues is a precondition for men and women to understand their differences and give proper consideration to one another. The capacity of women to give birth means that, throughout their lives, they have health issues that are distinct from those of men. In 1994 the International Conference on Population and Development defined the concept of reproductive health rights and led to a heightened interest in women's health. In Japan, lifelong health for women is a priority of government plans on gender equality, and several women's clinics have recently been established in public hospitals. This development has been keenly welcomed by women because it takes gender differences into consideration.

During the Symposium you will be discussing these matters. I hope that you will identify strategies for improving gender sensitivity among policy-makers and researchers. I wish you every success and I feel sure that the Symposium will contribute greatly to the development of gender-sensitive medicine.

# INAUGURAL ADDRESS

# Inaugural address

**Dr Yuji Kawaguchi**
Director
WHO Centre for Health Development

Distinguished guests and experts, colleagues, ladies and gentlemen, it is a great pleasure for me to welcome you to the International Symposium on Gender-Sensitive Medicine, organized by WHO Centre for Health Development (WHO Kobe Centre – WKC) in collaboration with Chiba Prefecture, Japan. The Symposium is a unique opportunity for high-level experts from Japan and other parts of the world to share their knowledge and discuss ways of accelerating progress towards gender equity in health. A major obstacle is that gender-based medicine is often poorly understood by health professionals and others, despite advocacy over a good number of years by many groups, particularly women's groups, for the development of health services that specifically meet women's needs and concerns.

Since becoming Director of WKC in 1999 I have placed emphasis on addressing these concerns. WKC's First International Meeting on Women and Health, held on Awaji Island, Hyogo Prefecture in April 2000, focused on "Better health and welfare systems: women's perspectives". This meeting and ones held in 2001 and 2002 demonstrated that as long as the gender perspective was inadequately represented in research there would be insufficient evidence to give the extra impetus and support for changes in policies, practices and the behaviour of providers.

One of the main objectives of WKC is to foster international and interdisciplinary studies on issues where additional knowledge is needed in order to support the development of global health and welfare systems. WKC seeks to improve the health of individuals and societies, worldwide, by bringing together the best knowledge and experience available. The present Symposium is an example of the type of forum organized for this purpose. The theme of women and health runs through all WKC programme activities. Our work is centred on the following three programme areas presenting significant challenges to the development of health and welfare systems.

1. **Cities and Health:** issues associated with the impact of rapid urbanization on people's health are addressed in this programme.
2. **Aging and Health:** this programme is concerned with the global population aging phenomenon and also has a strong component dealing with traditional medicine.
3. **Health and Welfare Systems Development *per se*:** Women and Health issues receive specific attention in this programme.

WKC has established close partnership relations with policy decision-makers and academics in each area of priority. These global networks are rapidly contributing to the efficient implementation of WKC's interrelated activities. This type of close involvement and commitment of leaders in different parts of the world augurs well for the results of work to be carried forward jointly into the policy-making process, with a view to pragmatic, innovative programmes for the improvement of people's health and quality of life.

With reference to gender perspectives in health, WKC's three International Meetings on Women and Health in 2000, 2001 and 2002 provided a considerable insight into the principal areas of concern. Reports on the proceedings of these meetings have been widely distributed. I should like to highlight some important aspects of these forums in order to provide a background to today's Symposium.

At the First International Meeting on Women and Health held on Awaji Island, Japan, experts in the field were joined by representatives designated by governors and mayors of major cities in Japan. One of the recommendations made was that women's perspectives should be integrated into decision-making at all levels. Strategies for the empowerment of women were discussed and it was emphasized that these should enable women to adopt a more active role in health development. The meeting concluded with a declaration summarizing major matters of concern, one of which was gender bias preventing improvement in the health status of women and, indeed, of societies.

The Second International Meeting on Women and Health, held in Canberra, Australia in April 2001, focused on women's capacity-building and leadership in health development. It was pointed out that gender bias had not only hindered appropriate health infrastructure and policy development but had also adversely affected research and knowledge utilization. Scientific research about women had often been gender-blind, resulting in weaknesses in the establishment of health policies and programmes. It was necessary for data collection to be carefully designed and for disaggregated data on public health and health services to be analysed by sex in order to identify gender differences in experiences, impacts, causes and responses to health needs. Such analysis had to be used to develop effective public health initiatives involving communities and appropriate partners so as to ensure that services were responsive and accountable to women. The Canberra Communiqué was intended to encourage governments to develop and disseminate information on positive actions for enhancing capacity-building and leadership among women.

The Third International Meeting on Women and Health, held in Kobe, Japan, in April 2002, addressed a number of priority areas with a view to introducing gender sensitivity into the public health agenda, health policies, planning and programming. It was noted that some of the main problems stemmed from political and social contexts that were largely indifferent to women's needs, i.e. they were designed to address the needs of the male population. Institutional infrastructures and management needed to be upgraded and established within a new ethical framework that was gender-inclusive, responsive and participatory. The Kobe Plan of Action for Women and Health, involving both immediate and long-term priority actions, was drawn up, and Task Forces were established to conduct research in the following priority areas.

1. Comparison of the health indicators used by international agencies and evaluation of these for gender equity/equality.
2. Identification of good practices in the use of gender-based analysis.
3. Description, analysis and development of women's leadership in health.
4. Augmentation of research transfer in specific gender equity and health issues.

It is intended that the results of the Task Forces' work will be reported at the Fourth International Meeting on Women and Health to be held in Tanzania later in 2003.

It is clear from the first three international meetings referred to above, and from related initiatives, that structural changes to mainstream programmes and practices are required if optimal health outcomes for women are to be achieved. Moreover, public health successes in recent decades have shown that the magnitude of sex differentials in mortality, morbidity and health status varies considerably in response to political, social, economic, cultural and environmental conditions and to health care services and facilities. It is therefore necessary to measure health in relation to gender in diverse cohorts, life cycle experiences and broader social contexts. The evidence gained should then be reflected in health policy planning and programming so that health services can be optimally functional, effective and measurable on a continuing basis.

We should now work to bring about change so that, in the future, it will be possible to point to opportunities taken to bring about a better understanding of gender-specific health care rather than to opportunities to improve women's health which were lost because of gender-blind research and gender-blind health services.

This Symposium is a milestone event. The wealth of expertise represented here today makes me confident that directions for meaningful research collaboration through information exchange can be outlined and that it will consequently be possible to present sound evidence so as to influence the incorporation of a gender perspective into health policies and services. In the long run, investment in such research can be expected to benefit people in all parts of the world.

Thank you very much for your attention and may I wish you interesting and fruitful deliberations.

THEME 1:

# GENDER-SENSITIVE MEDICINE

# Women's health in the 21st century: moving towards sex-based biology / gender-specific medicine

**Dr Marianne J. Legato***
Professor of Clinical Medicine
Columbia University College of Physicians and Surgeons
United States of America

## Abstract

The past fifteen years have witnessed profound changes in our understanding of normal human function and the pathophysiology of illness. Societal and cultural changes over the past century, particularly those arising from the Second World War, increased the power and influence of women. They also expanded the scope and depth of medical science. Life expectancy has virtually doubled over the past hundred years. The long period of relative peace that followed the Second World War produced tremendous advances in our understanding of how to prevent illness and mitigate the course of disease. Some of the most impressive gains in our knowledge base are the consequence of exponentially increased political and financial support for the study of the female patient. Women's health has been an enthusiastically embraced subject in the USA over the past 18 years, beginning with the 1985 report of the Public Health Service's Task Force on Women's Health. This report acknowledged that very little was known about the health of women except in relation to their reproductive biology. The organized scientific establishment in the USA, centred in the National Institutes of Health, and the political systems embodied in the Congress, lent support to claims that it was necessary to learn more about women by direct investigation of female patients. The result has been tremendously increased attention to and support for a better understanding of female biology and how it differs from that of men.

## Keywords

Women; Health; Gender-specific medicine; Postmenopause; Osteoporosis; Reproductive biology; Biological sex; Inequities; Biological sex; Societal changes; Coronary disease; USA.

## Women's health in the 20th century

At the beginning of the 20th century, women had little direct control over the world around them. They had virtually no access to the professions and most worked as domestic

* **Dr Marianne J. Legato** is an internationally known academic physician, author, lecturer and specialist in women's health. She is Professor of Clinical Medicine at Columbia University College of Physicians and Surgeons, USA and the Founder and Director of the Partnership for Gender-Specific Medicine at Columbia University. Dr Legato has done extensive research on the structure and function of the cardiac cell. She has received many awards for her leadership role in women's health. She was named an "American Health Hero" by American Health for Women in 1997. Her latest book on gender-specific medicine, *Eve's rib*, published in 2002, is aimed at the general public.

servants, companions and governesses. The average life expectancy was 48 years old for both sexes. Women did not live long enough to experience postmenopausal life and the diseases of aging, viz. osteoporosis, coronary artery disease and dementia. In fact, they faced quite different problems: they perished in childbirth or from overwhelming infections that were significantly related to poor public hygiene. Many died from accidents: in New York City, for example, many burned to death when their voluminous clothing ignited as a result of close proximity to open fires or the candles in their homes.

The Second World War produced tremendous societal change. Women replaced men in the work force at all levels, even entering professional schools and pursuing careers to which they could not have aspired previously. Women were admitted to orthopaedic and surgical residencies for the first time in American medical history. Others became chief residents and teaching and researching physicians in medical faculties. The feminist movement was an inevitable outcome of women's experiences of work and decision-making during this period.

The Second World War also led to rapid scientific advances in the medical field. Improvements in methods of sanitation and public hygiene greatly increased the survival and well-being of whole populations. Doctors used antibiotics for the first time to fight infectious diseases. In 1944 the United States Congress passed the Public Health Service Act, which expanded federal funding for medical research. Between 1955 and 1968 the National Institutes of Health grew dramatically under the direction of Doctor James A. Shannon.

In 1986 the special Task Force on Women's Health of the United States Public Health Service reported that, apart from reproductive biology, very little was known about women's unique physiology and experience of disease. The National Institutes of Health urged that more women be included in clinical investigations. Four years later the General Accounting Office observed that the new guidelines were not being implemented with any regularity (*1*). For example, of 50 applications submitted for federal funding, one-fifth had no information about the sex of the study cohort. One-third proposed the inclusion of both sexes in study groups but failed to specify or justify the numbers of men and women. Where it was intended to include only males, no rationale was offered for the single-sex design. In order to remedy such inequities, the National Institutes of Health established the Office of Research on Women's Health. In 1993, Congress passed the National Revitalization Act which, among other things, gave legislative authority to this body and appropriated monies for the direct investigation of female subjects. New requirements were introduced for the inclusion of women and minorities in federally funded clinical studies except where specific criteria for the exclusion of these groups could be satisfied.

## Research on the female subject: protectionism versus access

The virtual exclusion of women from clinical investigation in the USA arose as a consequence of legislation that was designed to protect them and other vulnerable groups from abuse in this field. In response to the malformations that occurred in children born to mothers who used thalidomide during pregnancy, the Kefauver-Harris amendments of 1962 required all new drugs to undergo a rigorous pre-approval process conducted by the Federal Drug Administration. The Helsinki Declaration of 1964 made recommendations for the conduct of medical investigations. In the USA the National Research Act of 1974 incorporated guidelines for the protection of patients into federal regulations and mandated

the establishment of Internal Review Boards. The role of these bodies was to review the compliance of proposed investigations with the regulations. These changes, together with the perceived dangers to the reproductive ability of young women and/or to children conceived during the testing of interventions, essentially eliminated women as clinical research subjects. Researchers assumed that any information obtained from studying men could be extrapolated to women without separate testing or modification. In 1978, however, the Belmont Report drew attention to the importance of justice in clinical investigation, indicating that if women were to benefit from the results of clinical trials they should be expected to participate in them.

## Where are we in 2003? What questions should we be asking?

Many members of both the academic and practising medical communities continue to believe that the only significant differences between men and women are in their reproductive biology and hormonal milieu. Debate continues over which subspecialists should care for women. For example, gynaecologists maintain that they have always cared for women and that they are trained to understand and meet the unique needs of female patients. However, other people believe that generalists such as internists or family doctors are better qualified to fulfil this role.

Probably of greater importance is the confusion that exists as to which of the unique features of women's normal function and their experience of disease are a consequence of biological sex and which are attributable to societal and cultural mores. The separation of biological influences from cultural influences is very difficult. Consequently, WHO and the Office of Research on Women's Health of the National Institutes of Health in the USA have urged careful consideration of the difference between the terms "sex" and "gender" and have recommended that the array of scientific disciplines brought to bear on these matters be much broader than formerly, i.e. that anthropolgists, social workers, historians and economists be included among the researchers.

Debate continues on whether the exclusion of women from clinical research has adversely affected their health. Whereas overall life expectancy in the USA increased between 1900 and 2000 from 48 to almost 86 years, women continue to survive men by an average of six years. However, the quality of life of the oldest women is often marred by dementia, osteoporosis and end-stage cardiovascular disease.

There are well-founded concerns that government guidelines on including females in study protocols restrict the scientific community too severely. Many studies include women in insufficient numbers to test the impact of sex or gender on the data produced, which, consequently, may not be true of either women or men. It is sometimes argued that the difficulty of recruiting women in sufficient numbers for meaningful clinical investigation, particularly women in their childbearing years, is often insurmountable. It is no coincidence that the largest studies on women, e.g. the Women's Health Initiative sponsored by the National Heart, Lung and Blood Institute in the USA, are exclusively devoted to postmenopausal women. In the Women's Health Initiative the mean age of the subjects was 67 years. The advanced mean ages of the participants in recent studies on the impact of hormonal replacement therapy on cardiovascular disease has resulted in substantial controversy about the meaning of the results for much younger postmenopausal patients.

Some of these issues are complex and very difficult to resolve. We remain locked in debate concerning what to do about women's health. Is it worth deploying substantial resources to develop systems of care that regard women as special and significantly different from men? Moreover, it is still unclear whether women themselves will welcome a continuing effort to define and emphasize the differences between men and women. Many women consider that this approach is likely to destabilize and reverse the gains of the feminist movement.

There are important data that fortify the premise that sex-specific biology and gender-specific medicine are viable and crucially important new areas of interest for the progress and expansion of our ability to care for patients. The latest affirmation of this comes in a monograph of the United States Institute of Medicine (*2*): "Sex does matter. It matters in ways that we did not expect. Undoubtedly, it also matters in ways that we have not begun to imagine."

## What does the future hold?

### *Barriers to learning more about women*

Not all academic medicine's leaders are enthusiastic to learn more about women. The view that women's health is merely a matter of reproductive physiology still prevails in many training centres. There is resistance to the expansion of clinical studies to include women in many established research enterprises, because it is risky, requires more financial support and may not prove to be worth the effort. A view of women's health as a feminist, commercial or boutique issue persists in many institutions. Furthermore, society in general still regards males as more important and valuable members of the societal fabric than females.

### *Making women's health a substantive issue*

Women's health is not a feminist, political or emotional issue. Studying women directly is an essential step in developing the new and more inclusive discipline of gender-specific medicine. Our most important task is to convince the scientific, medical and lay communities that women are a source of invaluable information that can improve the health of all patients. Outcome studies are essential if we are to justify and maximize a continuing interest and investment in women's health. It is necessary to prove that morbidity and mortality can be diminished by translating the new scientific information we are acquiring into new ways of detecting, preventing and curing disease. Only in this way can we justify and maximize a continuing interest and investment in women's health. Scientists need clear evidence that data relating to men cannot be assumed identical to data relating to women. Utilizing the variable of sex or gender in research protocols provides a basis for questions that would not otherwise be asked.

Data proving that more information about the unique features of women's normal physiology and their experience of disease are essential if better health for all patients is to be achieved. In the absence of such data, interest in women's health can be expected to decline.

## References


1. United States General Accounting Office. Statement of M. V. Nadel. 18 June 1990.
2. Wizemann TM, Pardue M, editors. *Exploring the biological contributions to human health. does sex matter?* Washington DC: Institute of Medicine, National Academy Press; 2001.

# Why gender-based medicine is good medicine

**Professor Jill Astbury***
Deputy Director / Associate Professor
Key Centre for Women's Health in Society
University of Melbourne
Australia


## Abstract

Awareness of the need for good quality evidence as a necessary basis for effective clinical practice and relevant and useful health programmes and policies is higher than ever before. At the same time, there is a growing recognition of the critical relationship between health and human rights.

However, the historic neglect of the role of gender in health status and health care has resulted in a serious lack of evidence on many health conditions. This has produced a health care system that is gender-blind and actually contributes to the creation of inequities in health. This paper examines three important dimensions of this problem. It considers the effects of gender bias in diagnosis and treatment, it examines the need for gender-based evidence in medicine, and – using mental health as an example – it discusses how attention to gender and rights can be implemented in order to provide gender-sensitive health care.

## Keywords

Gender; Sex; Awareness; Human rights; Gender-blind; Inequities in health; Gender-bias; Gender-sensitive health care; Mental health.

## Introduction

Over the last ten years there have been three important developments in thinking about health.

First, there has been a widespread recognition of the need for evidence-based medicine, i.e. medicine based on evidence that is of high quality, providing the most rational and therefore the preferred foundation for clinical practice, health programming and policy-making.

---

*** Professor Jill Astbury** is Associate Professor and Director of the Key Centre for Women's Health in Society, WHO Collaborating Centre in Women's Health, University of Melbourne, Australia. The Key Centre's postgraduate courses in Women's Health have been taught in Japan since 1995. Professor Astbury is a member of the Victorian Government's Ministerial Advisory Committee, which is developing a Women's Health Plan for the State of Victoria. Her publications include *Women's mental health: An evidence-based review* and *Mental health determinants and populations* (WHO) and *Addressing women's health information needs* (Department of Human Services, Victoria).

Second, there has been an increased understanding of the inextricable relationship between health status and outcomes on the one hand and human rights on the other. The public health goal of ensuring the conditions in which people can be healthy clearly overlaps with and shares the human rights goal of identifying, promoting and protecting the societal determinants of human well-being.

Third, it is now fully acknowledged that equity in access to health and health care is a fundamental right and that, consequently, gender is a critical determinant of health. Gender, understood as a social construct and category, has explanatory power with respect to differences in men's and women's susceptibility and exposure to specific health risks. Gender influences the power men and women have for controlling and protecting their lives and health, coping with risks to health and influencing the direction of the health development process. The concept of gender permits us to ask questions about how the social categories occupied by women and men differentially affect how they see, experience and understand the world and themselves. It has been demonstrated that gender differences profoundly influence health over the whole range of diagnosis, treatment and outcomes.

Improvements in medicine require all three dimensions, i.e. evidence that is of good quality, the protection of human rights and the role of gender, to be fully covered in research, clinical practice and health policy.

In this paper the importance of integrating gender into both research and practice are discussed with particular reference to mental health. This focus has been chosen because depression is predicted to be the second leading cause of global disability by 2020 and because there are significant differences between men and women in its prevalence (*1*). The argument is presented that satisfactory results can only be achieved if gender-based medicine is practised. In order to arrive at gender-based and gender-sensitive medicine, various kinds of action are required. Some of these are discussed below.

## Gender bias in research

The first task is to remove gender bias from scientific investigation. If research is flawed by either gender bias or gender blindness the results can be expected to be distorted and misleading. Gender-biased research leads to gender-biased medicine that fails to respond to health needs, especially those of women.

Perhaps the most basic form of gender bias is the continuing failure of some health researchers and bureaucrats to ensure that data are collected in a manner permitting subsequent disaggregation on the basis of sex, followed by gender analysis. Unless sex-disaggregated data are available it is difficult to begin a gender analysis and impossible to extract the most basic information on gender differences in access to health care, help-seeking behaviours, the utilization or uptake of services, rates of ill health, effects of interventions, and satisfaction with the quality of care provided. In such circumstances there can be no evidence base to inform practice, policy or programmes and ad hoc planning is inevitable.

However, the collection and analysis of gender-disaggregated data cannot in themselves overcome gender bias in scientific investigation. It is also imperative to pay attention to the measures of health, illness, social status and health risk employed in research and to ascertain whether they can capture important gender differences that have a bearing on health. Many

of the measures of mental health status and outcomes are unsatisfactory for this purpose. They ignore the impact of cumulative psychosocial adversity (*2*), ignore the presence and consequences of gender-based violence (*3*) and are blind to recent structural economic reforms that pose additional socially based gender-specific risks to mental health (*4*).

Gender tools should also be developed which can assess the gender impact of changes in health policies. For example, the shift to "user pays" philosophies in many countries substantially transfers the cost burden of health care from government to individuals. As women typically earn and own less than men in all countries, this disproportionately affects them and makes health care increasingly expensive and inaccessible to them.

Gender socialization and stigmatization can also differentially influence men's and women's help-seeking behaviour. Men are more likely than women to admit seeking help for alcohol-related problems and to express concern over receiving a psychiatric label. In contrast, women are more likely than men to endorse seeking help for emotional problems and to be concerned about receiving a drinker label (*5*). Unless screening instruments and measures of mental disorder are alert to the possible bias exerted by such gender norms, both under- and over-ascertainment of specific disorders can occur.

## Biological reductionism

Historically, research into women's health without a strong gender perspective has concentrated on reproductive health and has neglected important areas. For example, the link between gender, depression and cardiovascular disease (*6*) used to be ignored for two reasons, both of which relate to forms of gender bias.

- First, no distinction was made between sex and gender. In some languages the equivalent of the word "gender" did not exist and consequently it was impossible to identify socially constructed or gender-based differences. As a result, the fact that rates of depression were two or three times higher in women than in men was attributed to sex or biological differences between them. Such causal misattribution led researchers in this field to concentrate almost exclusively on biological, reproductive and hormonal factors.
- Second, women were excluded over a long period from cardiovascular research. Ironically, this happened because of their reproductive biology, as it was feared they might become pregnant or that their menstrual cycles would create unnecessary complications in research designs. Consequently, the development of an evidence base on gender-specific cardiovascular risk factors and treatment was retarded.

Unless gender bias is eliminated in the design and implementation of research, significant associations between gender and physical and mental health will continue to be overlooked.

## Gender-based medicine

Gender-based medicine recognizes and responds in a sensitive manner to the multiple effects of gender on the production and maintenance of both health and ill health. It implies a

thorough understanding of gender-specific risks to health. In this connection the impact of gender-based violence on health is of particular importance.

There is abundant evidence of the importance of gender-based violence in a range of adverse health effects on women in the short, medium and long term. Specific patterns of injuries have been identified. The head, face, neck, thorax, breasts and abdomen are the most frequently targeted parts of the body. The injuries, together with the fear and stress associated with violence, which typically increase over time, result in chronic health problems such as pain syndromes, gastrointestinal and other physical disorders and poor self-reported health, as well as a wide range of mental health disorders, especially depression, anxiety, post-traumatic stress disorder, and phobias. Mental health problems appear to be particularly long-lasting. Many gynaecological problems follow rape or forced sex, among them sexually transmitted diseases, pain on intercourse, chronic pelvic pain and urinary tract infections. Changes in patterns of health care utilization have been noted, including an increase in the use of primary and emergency care and a decrease in the use of cervical screening and other preventive care (*3*).

It is imperative that the results of research are fully integrated into health care practice if the objective of truly gender-based medicine is to be realized. The evidence of links between gender-based violence and poor health is very strong. Consequently, health professionals who do not identify or investigate a history of such violence and are unable to recognize or respond to its multiple presentations in clinical practice are working in a second-rate manner or may even be criminally negligent. Practitioners have a duty of care to their patients. To remain unaware of the health effects of violence or, worse, to ignore them, is a failure to fulfil this duty.

The murder of women by their intimate partners is the most serious form of violence against women. It is estimated that between 40% and 60% of murders of women in the USA are perpetrated by intimate partners. A study in that country revealed that intimate partner abuse was a significant factor in 66% of the lives of women who were murdered and that 41% had used health care for either injury or physical or mental health problems in the year before their deaths (*7*). All such visits to health care providers offer opportunities for the identification of women in violent relationships and for intervention. To the extent that violence remains unaddressed, these opportunities to prevent fatal injuries are being wasted.

Repeatedly treating the symptoms of violence, while failing to enquire about their underlying cause, to formulate safety plans with the women concerned, or to provide trauma-focused counselling, constitutes poor medical practice that clearly does not respond to the real needs of patients.

## Operationalizing gender and rights

The provision of gender-based medicine depends on the realization or operationalization of gender and rights in health care. This means applying the considerable evidence that exists of the relationship between gender and health and observing the principles of access and equity in relation to both health care and health information.

The reproductive rights framework that has already been articulated serves as a useful model for mental health and other areas of health. The inclusion of rights as indicators of the quality of health care should be adopted in research on health services with a view to

improving the ethical and interpretive dimensions of research. It is not known what effects there are on health of failure to gain informed consent, the denial of patient privacy, the use of interventionist practices that have no scientific justification, and other human rights violations. Evidence on such matters should be routinely collected in order that rights and gender concerns can be seriously integrated into research and clinical practice.

Gender-based medicine requires that traditional models of health care be revised. Central to this revision is health care that meets the real and perceived needs of patients and a respectful partnership between practitioners and patients based on fully informed consent and involvement in decision-making. For example, the improvement of reproductive health care and outcomes for women in both developed and developing countries is unlikely to be achieved unless women's own health concerns and life priorities are taken into account in the design and implementation of programmes. For this reason it is necessary to promote the concept of meaningful assistance in health care. This implies a patient-centred approach responding to the sum of the health problems being experienced rather than the treatment of different problems in isolation.

Meaningful assistance demands sufficient time for consultation. It may be argued that assigning consultation time that is sufficient to elicit a history of violence in a gender-sensitive manner is too time-consuming and costly. However, in the absence of such care a victimized woman can be expected to seek help repeatedly, there will be a concomitant increase in costs to the health care system, and there will be no change in the underlying and unaddressed causes of her ill health. Unless there is recognition of and an effective response to the violence to which she is subjected, her health can be expected to continue deteriorating.

Three important conditions that disproportionately affect women are poorly diagnosed in primary health care: depression, gender-based violence and its health-related effects, and physical and psychiatric comorbidity, which may encapsulate the first two conditions.

Comorbidity is of particular interest. Women are overrepresented in the population of people who suffer from three or more concurrent psychiatric disorders (*8*). Comorbidity is associated with a heightened burden of psychiatric disability and is commonly reported among women who have experienced violence. It is necessary for health care providers to recognize the complex linkages between depression in women, multisomatization and psychiatric comorbidity in the context of a history of violent victimization.

Only when meaningful assistance is routinely available for women with these highly interrelated and serious health conditions and when gender and rights are given the attention they deserve will it be possible to argue that gender-based medicine is truly being practised.

## References


1. Murray JL, Lopez AD. *The global burden of disease: A comprehensive assessment of mortality and disability from diseases, injuries and risk factors in 1990 and projected to 2020. Summary.* Cambridge, Massachusetts: Harvard School of Public Health; 1996.
2. Bracke P. The three-year persistence of depressive symptoms in men and women. *Social Science and Medicine* 2000;51:51–64.
3. Astbury J. *Women's mental health: An evidence-based review.* Geneva: World Health Organization; 2000.

4. Patel V, Araya R, de Lima M, Ludermir A, Todd C. Women, poverty and common mental disorders in four restructuring societies. *Social Science and Medicine* 1999;49(11):1461–71.
5. Allen LM. Nelson CJ, Rouhbakhsh P. Gender differences in factor structure of the self-administered alcoholism screening test. *Journal of Clinical Psychology* 1998;54:439–45.
6. Musselman DL, Evans DL, Nemeroff CB. The relationship of depression to cardiovascular disease. *Archives of General Psychiatry* 1998;55:580–92.
7. Sharps PW, Koziol-McLain J, Campbell J, McFarlane J, Sachs C, Xu X. Health care providers missed opportunities for preventing femicide. *Preventive Medicine* 2001;33(5):373–80.
8. Kessler RC, McGonagle KA, Zhao S, Nelson CB, Hughes M, Eshleman S, et al. Lifetime and 12 month prevalence of DSM-III-R psychiatric disorders in the United States. Results from the National Comorbidity Survey. *Archives of General Psychiatry* 1994;51(1):8–19.

THEME 2:

# RESEARCH ON GENDER-SENSITIVE MEDICINE

# The clinical features of women with variant angina pectoris

**Dr Hiroaki Kawano***
Department of Cardiovascular Medicine
Kumamoto University School of Medicine
Japan

## Abstract

Coronary spasm plays an important role in the pathogenesis not only of variant angina but also of ischemic heart disease in general. The incidence of ischemic heart disease is relatively uncommon in premenopausal women but shows a sharp rise after natural or surgical menopause. The decline of endogenous ovarian hormones is commonly assumed to be a major component of this phenomenon. Estrogen has been reported to improve arterial endothelial function. As endothelial dysfunction is one of the reasons for coronary spasm, estrogen may also be effective in suppressing coronary spasm.

To determine the effects of variations in ovarian hormones during the menstrual cycle in premenopausal women with variant angina, 10 patients were studied (age range 33 to 51 years) who had regular menstrual cycles of 27 to 32 days. During the study, all anti-anginal drugs, except sublingual nitroglycerin, were withdrawn.

Both frequency of ischemic episodes and flow-mediated endothelium dependent vasodilation were highest from the end of the luteal phase to the beginning of the menstrual phase, and were lowest in the follicular phase. The levels of estradiol were also lowest from the end of the luteal phase to the beginning of the menstrual phase, and were highest in the follicular phase. The average frequency of ischemic episodes was highest in the menstrual phase and lowest in the follicular phase. During the luteal phase, this frequency was below that of the menstrual phase.

We concluded that there exists a cyclical variation in the frequency of myocardial ischemia and the endothelial function in premenopausal women with variant angina. This variation is associated with the alteration of ovarian hormones, especially estrogen, in the menstrual cycle.

## Keywords

Women; Coronary spasm; Variant angina; Ischemic heart disease; Premenopausal; Menopause; Endogenous ovarian hormones; Estrogen; Myocardial ischmia and endothelial

---

*** Dr Hiroaki Kawano** is a medical doctor at the Department of Cardiovascular Medicine, Kumamoto University Hospital, Japan. He has received several awards including the American Heart Association Scientific Sessions Award (2001) and the Young Investigator Award of the Japanese Cardiovascular Foundation (2001). Dr Kawano has published several outstanding books and articles on women's health, including *Hormone replacement therapy for angina* (2002) and *Chest pain in postmenopausal women* (2002), both in Japanese.

function; Ovarian hormones.

## Introduction

Coronary spasm plays an important role in the pathogenesis not only of variant angina but also of ischaemic heart disease in general (*1*, *2*). The incidence of ischaemic heart disease is relatively uncommon in premenopausal women (*3*). The abundance of endogenous ovarian hormones is commonly assumed to be a major contributor to this phenomenon (*3*).

Estrogen slows the development and limits the adverse effects of atherosclerosis, partly by ameliorating vascular endothelial dysfunction (*4*). As such dysfunction is reported to be one of the reasons for coronary spasm (*5*) it is possible that the latter can be suppressed by estrogen. We sought to examine whether the variation in ovarian hormones during the menstrual cycle affects the frequency of myocardial ischaemia in premenopausal women with variant angina.

## Methods

Variant angina was defined as recurrent attacks of chest symptoms occurring spontaneously at rest, with ST-segment elevation in the electrocardiogram, rapidly relieved by nitroglycerin. Ten eligible premenopausal women aged 33−51 years and of mean age 44.8 years were enrolled. All had had regular menstrual cycles (27–32 days, mean 29.2 days) for more than three months before entering the study. All antianginal drugs except sublingual nitroglycerin were withdrawn during the study. The patients all gave written informed consent and the study was approved by the ethics committee of our institution.

All subjects had coronary spasm as indicated by chest symptoms and ST-segment elevation after intracoronary injection of acetylcholine, which causes vasodilation when the endothelium is functioning normally (*6–8*). One subject showed 50% organic stenosis of the left anterior descending coronary artery. The others showed no fixed stenosis after intracoronary injection of nitroglycerin. The clinical characteristics of the subjects are summarized in Table 1.

The study was performed between two to three days before the predicted beginning of menstruation and two to three days after the beginning of the next menstruation. The subjects underwent ambulatory electrocardiographic monitoring for 24 hours every day so that the frequency of spontaneous ischaemic episodes could be evaluated.

Endothelial function was evaluated by flow-mediated dilation of the brachial artery every other morning using a 7.5-MHz linear array transducer (SSH-160A, Toshiba, Tokyo, Japan) (*9–14*).

The menstrual cycle was divided into three phases; menstrual, follicular and luteal (from ovulation to menstruation), which were determined by reference to the serum estradiol and progesterone concentrations, the previous menstrual cycle, the basal body temperature and genital bleeding. The levels of estradiol and progesterone were determined by specific immunoradiometric assay every other day from blood samples obtained in the fasting state (*9*).

The Tukey-Kramer test was used to evaluate pairwise mean differences between the three phases. The effects of estradiol and progesterone on flow-mediated vasodilation were analysed by means of a linear multiple regression model. The effects of estradiol, progesterone, flow-mediated and nitroglycerin-induced vasodilation on the frequency of ischaemic episodes were analysed by using a Poisson multiple regression model. As explanatory variables, we adapted two dummy variables representing the relative effects of the follicular phase and the luteal phase in comparison with the effect of the menstrual phase. The response variables of each patient were assumed to have a first-order autoregressive correlation structure. The analyses were performed by SAS/STAT Version 6.12 (SAS Institute, Cary, North Carolina). Statistical significance was defined as $P < 0.05$. All data are expressed as means ± standard errors.

## Results

All the subjects showed good tolerance. The ischaemic episodes peaked from the end of the luteal phase to the beginning of the menstrual phase and bottomed in the follicular phase (Fig. 1). The levels of estradiol and flow-mediated vasodilation bottomed from the end of the luteal phase to the beginning of the menstrual phase, and peaked in the follicular phase. The progesterone concentration increased only in the luteal phase.

The average frequency of ischaemic episodes was highest in the menstrual phase and lowest in the follicular phase. The frequency in the luteal phase was lower than that in the menstrual phase (menstrual, 3.9 ± 0.6 episodes/day*; follicular, 0.3 ± 0.1 episodes/day; luteal, 2.6 ± 0.2 episodes/day*; *$P = 0.0001$ vs. follicular, $P = 0.01$ menstrual vs. luteal). The levels of flow-mediated vasodilation and estradiol were lowest in the menstrual phase and highest in the follicular phase (menstrual, 1.67 ± 0.23%, 32.3 ± 3.6 pg/ml; follicular, 8.16 ± 0.35%, 153.9 ± 12.8 pg/ml; luteal, 5.69 ± 0.25%, 72.1 ± 6.3 pg/ml; $P = 0.005$ between any two means). Nitroglycerin-induced vasodilation remained unchanged (menstrual, 19.62 ± 0.18%; follicular, 19.47 ± 0.17%; luteal, 19.45 ± 0.11%). The progesterone levels were highest in the luteal phase (menstrual, 0.72 ± 0.10 ng/ml*; follicular, 1.19 ± 0.23 ng/ml*; luteal; 10.25 ± 0.47 ng/ml, *$P = 0.0001$ vs. luteal).

In the linear regression analysis for flow-mediated vasodilation the regression coefficients of estradiol, progesterone and the follicular and luteal phases (compared with the menstrual phase) were 0.019% × ml/pg ($P = 0.0001$), 0.032% × ml/ng ($P = 0.24$), 3.0% ($P = 0.0001$) and 2.2% ($P = 0.0001$) respectively; the autocorrelation coefficient was 0.570. In the Poisson regression analysis for ischaemic episodes the regression coefficients of estradiol, progesterone, the follicular and luteal phases and flow-mediated and nitroglycerin-induced vasodilation were –0.0048 ml/pg/day ($P = 0.0040$), –0.0070 ml/ng/day ($P = 0.49$), –0.63/day ($P = 0.0001$), 0.12/day ($P = 0.60$), –0.11%/day ($P = 0.0009$) and 0.012%/day ($P = 0.84$) respectively; the autocorrelation coefficient was 0.566. Estradiol had a significant effect on flow-mediated vasodilation but progesterone did not. Fig. 2 shows the relationship between estradiol and ischaemic episodes. Estradiol and flow-mediated vasodilation had a significant effect on ischaemic episodes but progesterone did not.

## Discussion

Estrogen increases nitric oxide synthase activity in the vascular endothelium (*4*). The magnitude of flow-mediated vasodilation of the brachial artery, which is mainly dependent on endothelium-derived nitric oxide (*15*), closely reflected the variation in estradiol. These results are consistent with previous reports that the variation in ovarian hormones during a menstrual cycle affects the endothelial function of the brachial artery in healthy premenopausal women (*9–11*).

We previously reported that patients with coronary spasm had a disturbance in the endothelial function of the coronary arteries as well as a hypercontractile response of vascular smooth muscle (*5*). We have also reported endothelial dysfunction in the brachial arteries in patients with coronary spasm (*12*). As endothelial function in the brachial and coronary arteries are closely related (*12*, *13*), this modulation of endothelium-dependent dilation in the brachial artery probably occurs in the coronary arteries as well.

The precise mechanism or mechanisms of coronary spasm remain unknown. In this study the frequency of myocardial ischaemia was associated with the modulation of estradiol concentration and endothelial function. The ischaemic episodes seldom occurred when estradiol and flow-mediated vasodilation increased, and frequently occurred when estradiol and flow-mediated vasodilation decreased. Estrogen also directly relaxes vascular smooth muscle by antagonizing the calcium channels (*16*). It can therefore be assumed that the variation in estrogen affects endothelial and smooth muscle function and contributes to the alteration in the frequency of myocardial ischaemia.

Progesterone did not seem to affect either endothelial function or ischaemic attacks. Considerable controversy still exists over the role of progesterone. It has been suggested that progesterone does not influence the beneficial effects of estrogen on endothelial function (*11*, *14*), but it has also been suggested that antagonism occurs (*10*). Further studies are needed to establish the role of progesterone in this matter.

The frequency of ischaemic episodes decreased before the estradiol levels rose much in some patients. The physiological alternation of other ovarian hormones may also affect the variation of endothelial function and ischaemic episodes.

In premenopausal women with variant angina a cyclic variation in the frequency of myocardial ischaemia and endothelial function is associated with the alteration of ovarian hormones, especially estrogen, in the menstrual cycle.

## References


1. Yasue H, Omote S, Takizawa A, Nagao M. Coronary arterial spasm in ischemic heart disease and its pathogenesis. *Circulation Research* 1983;52(Suppl 1):147–52.
2. Hillis LD, Braunwald E. Coronary artery spasm. *New England Journal of Medicine* 1978;299:695–702.
3. Witteman JC, Grobbee DE, Kok FJ, Hofman A, Valkenburg HA. Increased risk of atherosclerosis in women after the menopause. *British Medical Journal* 1989;298:642–4.

4. Mendelsohn ME, Karas RH. The protective effects of estrogen on the cardiovascular system. *New England Journal of Medicine* 1999;340:1801–11.
5. Yasue H, Kugiyama K. Coronary spasm: Clinical features and pathogenesis. *Internal Medicine* 1997;36:760–5.
6. Furchgott RF, Zawadzki JV. The obligatory role of endothelial cells in the relaxation of arterial smooth muscle by acetylcholine. *Nature* 1980;288:373–6.
7. Ludmer PL, Selwyn AP, Shook TL, Wayne RR, Mudge GH, Alexander RW, et al. Paradoxical vasoconstriction induced by acetylcholine in atherosclerotic coronary arteries. *New England Journal of Medicine* 1986;315:1046–51.
8. Yasue H, Horio Y, Nakamura N, Fujii H, Imoto N, Sonoda R, et al. Induction of coronary artery spasm by acetylcholine in patients with variant angina. *Circulation* 1986;74:955–63.
9. Kawano H, Motoyama T, Kugiyama K, Hirashima O, Ohgushi M, Yoshimura M, et al. Menstrual cyclic variation of endothelium-dependent vasodilation of the brachial artery. *Proceedings of the Association of American Physicians* 1996;108:473–80.
10. English JL, Jacobs LO, Green G, Andrews TC. Effect of the menstrual cycle on endothelium-dependent vasodilation of the brachial artery in normal young women. *American Journal of Cardiology* 1998;82:256–8.
11. Hashimoto M, Akishita M, Eto M, Ishikawa M, Kozaki K, Toba K, et al. Modulation of endothelium-dependent flow-mediated dilatation of the brachial artery by sex and menstrual cycle. *Circulation* 1995;92:3431–5.
12. Motoyama T, Kawano H, Kugiyama K, Hirashima O, Ohgushi M, Tsunoda R, et al. Vitamin E administration improves impairment of endothelium-dependent vasodilation in patients with coronary spastic angina. *Journal of the American College of Cardiology* 1998;32:1672–9.
13. Anderson TJ, Uehata A, Gerhard MD, Meredith IT, Knab S, Delagrange D, et al. Close relation of endothelial function in human coronary and peripheral circulations. *Journal of the American College of Cardiology* 1995;26:1235–41.
14. Gerhard M, Walsh BW, Tawakol A, Haley EA, Creager SJ, Seely EW, et al. Estradiol therapy combined with progesterone and endothelium-dependent vasodilation in postmenopausal women. *Circulation* 1998;98:1158–63.
15. Joannides R, Haefeli WE, Linder L, Richard V, Bakkali EH, Thuillez C, et al. Nitric oxide is responsible for flow-dependent dilation of human peripheral conduct arteries *in vivo*. *Circulation* 1995;91:1314–9.
16. Freay AD, Curtis SW, Korach KS, Rubanyi GM. Mechanism of vascular smooth muscle relaxation by estrogen in depolarized rat and mouse aorta: role of nuclear estrogen receptor and Ca2+ uptake. *Circulation Research* 1997;81:242–8.

**Fig. 1. (a) Frequency of spontaneous myocardial ischaemic episodes. (b) Flow-mediated (solid line) and nitroglycerin-induced (broken line) vasodilations. (c) Serum estradiol levels. (d) Serum progesterone levels.**

The days of the three menstrual phases are adjusted to the mean days (menstrual 6.0, follicular 9.1, luteal 14.1) for every subject.

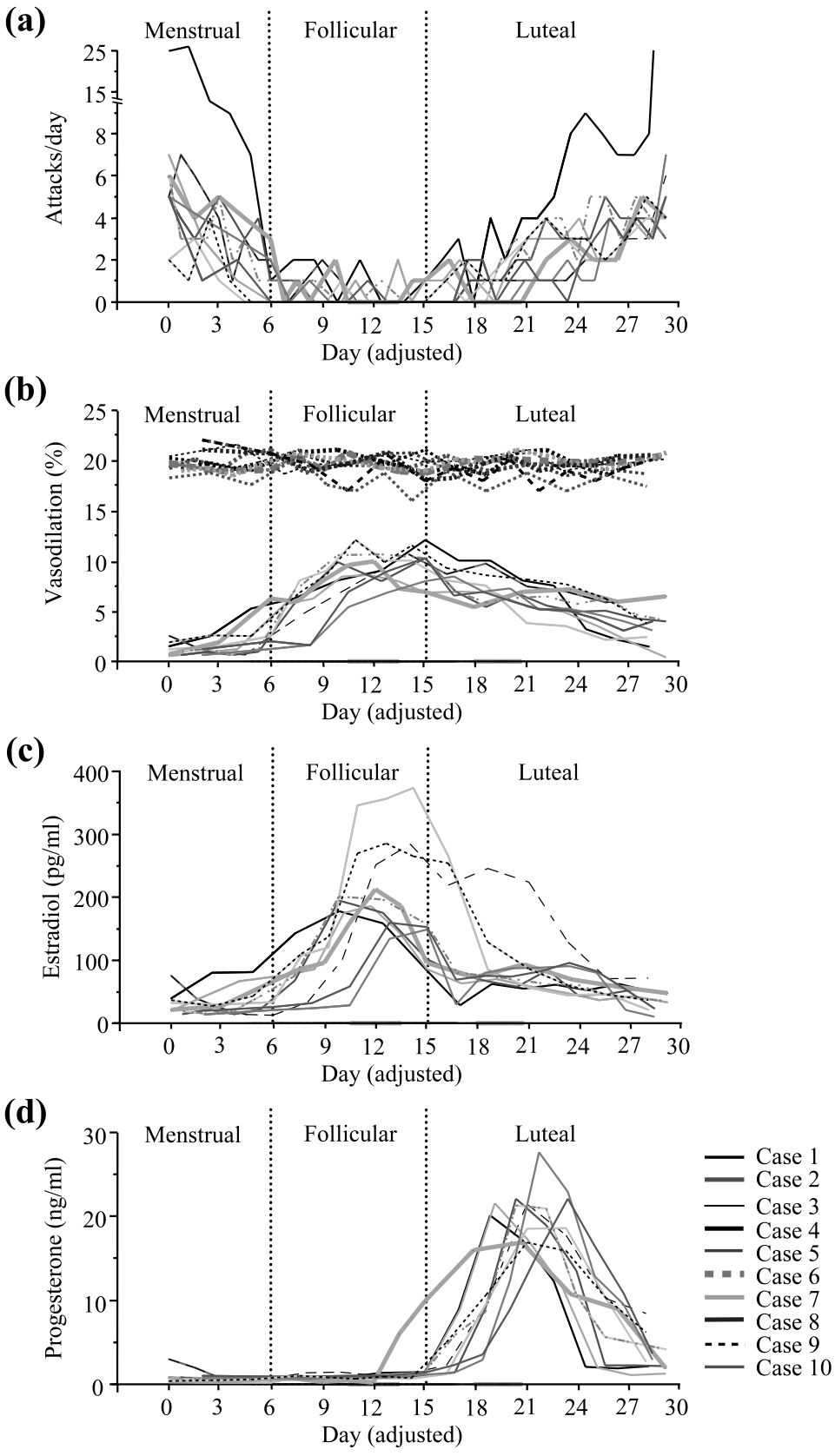


**Fig. 2. Scatter plots and smooth curves of serum estradiol levels vs. myocardial ischaemic episodes.**

Smooth curves fitted by kernel estimation.

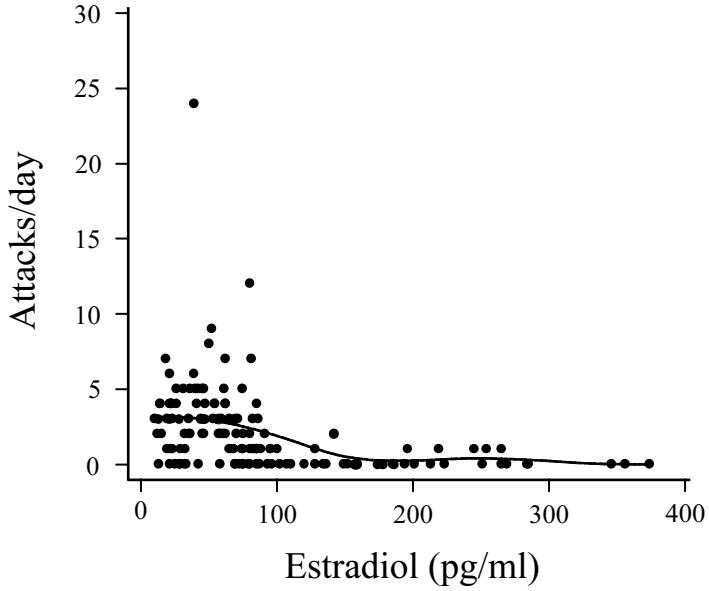


**Table 1. Clinical characteristics of subjects**

| Case No. | Age (years) | Menstrual cycle (days) | Smoking | T-chol (mg/dl) | HDL (mg/dl) | LDL (mg/dl) | TG (mg/dl) | Spasm artery | ST change site during spontaneous attacks |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 45 | 28 | Yes | 204 | 39 | 149 | 79 | LAD | V1-6 |
| 2 | 47 | 29 | No | 177 | 66 | 96 | 75 | RCA, LAD, LCx | V1-4 |
| 3 | 44 | 29 | Yes | 207 | 83 | 112 | 60 | LAD | V2-6 |
| 4 | 45 | 32 | Yes | 218 | 42 | 151 | 126 | RCA | II, III, aVF |
| 5 | 44 | 28 | Yes | 195 | 44 | 128 | 115 | RCA, LAD | V2-6 |
| 6 | 44 | 27 | Yes | 214 | 54 | 139 | 106 | RCA, LAD | II, III, aVF |
| 7 | 33 | 32 | No | 204 | 59 | 120 | 125 | RCA, LAD, LCx | II, III, aVF, V2-6 |
| 8 | 51 | 29 | No | 245 | 47 | 146 | 261 | RCA | II, III, aVF |
| 9 | 48 | 29 | Yes | 252 | 44 | 143 | 346 | RCA | II, III, aVF |
| 10 | 47 | 29 | No | 148 | 30 | 106 | 58 | RCA | II, III, aVF |
| Means | 44.8±1.5 | 29.2±0.5 | 60%* | 206.4±9.5 | 50.8±4.8 | 129.0±6.2 | 135.1±29.8 | | |

T-chol = total cholesterol.
HDL = high-density lipoprotein cholesterol.
LDL = low-density lipoprotein cholesterol.
TG = triglyceride.
RCA = right coronary artery.
LAD = left anterior descending artery.
LCx = left circumflex coronary artery.
* Percentage of smoking subjects.
Data expressed as means ± standard errors.

# Gender differences in the brain and its vulnerabilities to illness

**Dr William Byne***
Department of Psychiatry
Mount Sinai School of Medicine
and Bronx Veterans Affairs Medical Center
United States of America

## Abstract

Men and women differ in their vulnerabilities to particular neurological and psychiatric disorders, in their responses to therapy, and in the manifestations and clinical courses of these disorders. Such differences are not surprising because each cell within the nervous system differs chromosomally and genetically between the sexes. Genetic and endocrine factors interact in early development to produce brains that are sexually dimorphic in their rates of development as well as in their structural and functional organization. The brain possesses receptors for responding to particular gonadal hormones that may exert both beneficial and harmful effects and whose levels differ dramatically between males and females throughout much of the life cycle. The contribution of social, ethnic, cultural and economic factors to gender differences in disease vulnerability and expression has to be taken into account. A knowledge of how each of these variables contributes individually and collectively to observed gender differences in brain disorders is necessary for a comprehensive understanding of such disorders and for the development of more effective interventions.

## Keywords

Gender difference; Sex difference; Brain; Hypothalamus; Sexual differentiation; Schizophrenia; Laterality; Estrogen.

## Introduction

Gender differences are evident in the presentations and courses of various brain disorders. A knowledge of how genetic, hormonal and sociocultural variables contribute individually and collectively to gender differences in these disorders is necessary for a complete understanding of their etiology and for the development of more effective interventions. This paper will briefly address some of the genetic and endocrinological contributions to gender differences in the brain and to the disorders that affect it. Strictly speaking, sex refers to biological variables while gender refers to factors that can be attributed to living in the social role of a male or a female. The distinction between sex and

*** Dr William Byne** is Professor, Department of Psychiatry, Mount Sinai School of Medicine, New York, United States of America. He has received several honorary awards including the Barry Sherman Memorial Prize for Scholarship in Psychiatry (1993).

gender differences is not simple because all sex differences are expressed in, modified by, and interpreted in a social context. Disentangling sex and gender is particularly difficult in the brain and behavioral sciences where no presumed sex difference in humans has been demonstrated to be entirely independent of experience. For this reason, "gender" is used in the present paper to refer to phenomena for which the relative contributions of biological and social factors are unknown.

## Chromosomal sex differences and their significance

The human Y chromosome is about one-third the size of the X chromosome and contains about 25 genes, whereas over 700 are encoded on the X chromosome (*1*). Perhaps as many as 19% of genes on the X chromosome escape inactivation (*2*) suggesting that XX and XY brain cells may differ in their dose of particular X genes. Little information is available about which genes show such constitutive sex differences in expression (*3*). Nothing is known with certainty about how sex differences in the dosage of particular genes on the X chromosome might influence brain development and function, although a recent study suggests that the X chromosome is enriched in genes that influence mental function. Specifically, 21.1% of all mental disability traits map to the X chromosome, which contains only 3.8% of all genes (*4*). This may account in part for the 30% higher incidence of mental disability in males than in females. In particular, X-linked mental retardation is more severe in males, who have only one X allele (*5*). In females, deleterious mutations at mental retardation loci on one X chromosome are partially offset by normal alleles on the other X chromosome (*6*), as is the case with other X-linked disorders.

## Gender differences in the human brain

On average the male brain is approximately 10% larger than the female brain (*7*). This size difference cannot be accounted for solely by differences in body size. It may involve additional sex-specific factors (*8*, *9*). The asymmetry of the left and right hemispheres may be sexually dimorphic for the frontal (left greater than right in females and reverse in males) and occipito-parietal lobes (right greater than left in females and reverse in males) (*10*). Males have a higher percentage of white matter and/or cerebrospinal fluid than females, while females have a higher percentage of grey matter than males (*11*−*13*). Because of the overall difference in brain size between males and females the absolute volume of most brain regions tends to be larger in males. Neuroanatomists commonly assess the brain for sex differences in the volume of particular brain regions relative to overall brain size. Regional cortical sex differences, adjusted for differences in brain size, have been reported, although few reports have been adequately replicated (*15*). It has been reported that females have increased relative cingulate and dorsolateral prefrontal cortical volumes and that males have greater relative volumes of frontomedial cortex and possibly of inferior parietal lobule (*14*, *15*). The caudate nucleus is larger in females than in males, while the globus pallidus and putamen have been inconsistently reported as larger in males than in females (*15*).

Gender differences have also been described for three of the interstitial nuclei of the anterior hypothalamus (INAH), although the gender difference in only one of these, INAH3, has been consistently replicated by independent laboratories (*16*−*18*). This nucleus, which is larger in men than in women, appears to be the best candidate for homology with the much-studied sexually dimorphic nucleus of the preoptic area of rats (*17*). Similarly, a region

of the bed nucleus of the stria terminalis is larger in male animals and humans than in females (*19*). Both of these nuclei are believed to play a role in sexually dimorphic reproductive functions in animals (*18*, *19*).

A number of cognitive and motor functions tend to be lateralized in the human brain. The left hemisphere is more involved in language and control of the dominant hand, while the right hemisphere is typically more involved in visuospatial abilities (*20*). *In vivo* imaging of brain function suggests that the male brain is more asymmetrical than the female brain, developing a higher degree of separation of function than the female brain, which tends to share more functions between hemispheres (*21*). However, females exhibit more consistent right-handedness than males (*22*). Differences in asymmetry could result from differences in interhemispheric communication, which, in turn, might be reflected in the sizes of the commissures linking the hemispheres. Almost 50 studies have examined the corpus callosum, the largest of the interhemispheric commissures, for sex differences but none has been consistently found (*23*). Similarly, no consensus has emerged from four studies of the anterior commissure, which links portions of the left and right temporal lobes (*24*). Importantly, structural differences are not required for gender differences to appear in functional brain scans. Gender differences could arise even if males and females had identical brains but learned and employed different strategies and, therefore, used different brain circuits, in order to perform particular tasks.

## Origin of brain gender differences

The sex steroids, e.g. androgens, estrogens and progestins, are produced by the gonads and the adrenal glands. These hormones are present in both males and females but their levels and patterns of secretion differ between the sexes. For several decades it has been suggested that genomic factors determine whether the gonadal ridge forms testes or ovaries and that the rest of phenotypic sexual differentiation is dictated by gonadal secretions. Early exposure to testosterone and its metabolites, including estrogen (converted from testosterone by aromatase enzymes in the brain) was believed to masculinize the structure and functional potential of the mammalian brain (*25*). In contrast, the ovary was thought to be inconsequential with respect to early sexual differentiation of the brain. Female brain development was considered the default pattern, i.e. occurring in the absence of testicular hormones. Recently, ovarian passivity in sexual differentiation has been questioned (*15*) and a sexual dimorphism in a portion of the amygdala (which is larger in males than females) has been shown to depend on ambient androgen levels in adulthood rather than perinatally (*26*). In addition, considerable new evidence suggests that cell autonomous genetic mechanisms, i.e. mechanisms that are not hormonally triggered, contribute to brain sex differences (*25*). Despite these refinements, it is clear that early developmental exposure to differing levels of androgens and their estrogenic metabolites is a major factor in brain sexual differentiation, at least in experimental mammals.

A prenatal hormonal dependence has not been confirmed for any gender dimorphism reported for the human brain. Indirect evidence, however, suggests such an origin for the gender differences in INAH3 and a portion of the bed nucleus of the stria terminalis. Apparently homologous sexual dimorphisms in laboratory animals have been demonstrated to develop in response to sex differences in early hormonal exposure (*17*, *27*). Extrapolation from research on the rat suggests that the gender dimorphism in the size of the human amygdala may depend on postpubertal rather than prenatal ambient androgen levels (*19*).

The presence of estrogen receptors and the absence of aromata se enzyme in the primate cingulate cortex suggests a postpubertal role of estrogen in its structural dimorphism. Both hormonal (*28*) and genetic (*22*) hypotheses have been advanced to account for the gender differences in the structural asymmetry of the human brain. Neither, however, is satisfactory.

## Significance of brain sexual dimorphisms

If brain functions are lateralized or otherwise distributed differently according to gender, pathology affecting particular brain regions can be expected to produce different deficits in men and women. This issue has been debated extensively with respect to the incidence of language deficits following stroke. In a Stroke Data Bank study, in which the anatomical location of stroke was controlled for, there were no gender differences in the frequency of aphasia but lesions that produced aphasia in men were more posteriorly placed than those in women (*29*). This study also detected gender differences in the incidence of particular types of stroke and in the brain regions affected by them. These differences may reflect gender differences in cerebral circulation and other cardiovascular parameters.

The dorsolateral prefrontal cortex (*15*) and its primary thalamic relay, the mediodorsal nucleus (*30*), are both larger in normal females than in males. Both of these regions exhibit volume reduction associated with schizophrenia, which has a later onset in females than in males. Perhaps the greater volume of these structures in females provides a reserve that delays the onset of the illness. Similarly, the sexually dimorphic basal ganglia have been implicated in attention deficit hyperactivity disorder, Tourette's syndrome and various idiopathic and drug-induced movement disorders that exhibit gender differences (*15*, *31*). However, a mechanism linking these structural dimorphisms to gender differences in illness has yet to be identified.

It has been suggested that gender differences in structural and functional hemispheric lateralization account for the earlier onset of psychotic disorders and the increased incidence of particular neurodevelopmental disorders, e.g. dyslexia, in males than in females (*22*). In particular, it has been proposed that delayed maturation of the right hemisphere in males leaves them more vulnerable to neurodevelopmental insults, culminating in anomalous lateralization. Several sexually dimorphic asymmetries appear to be attenuated or reversed in schizophrenia (*10*, *22*, *30*, *32*).

Gender differences in the cingulate cortex may contribute to gender differences in mood, anxiety and psychotic disorders, all of which are exacerbated by abrupt decreases in estrogen levels, such as those that occur at the premenstrual, postpartum and perimenopausal stages (*35*). This cortical region is larger in women than in men and possesses estrogen receptors but not aromatase enzyme, suggesting that it is exposed to estrogen in women but not in men. Some studies have found its activity to be decreased in depressed and psychotic states. These findings suggest that cingulate activity and perhaps volume vary with fluctuating estrogen levels.

## The role of estrogen

Fetal androgen in human males is elevated between weeks 8 and 24 of gestation and then declines until birth. It increases from birth to a peak at 1 to 3 months and then decreases

to prepubertal levels by 4 to 6 months. In contrast, the ovary secretes substantial levels of estradiol during the first 6 to 12 months after birth (*15*). A sharp reduction of gonadal activity then occurs in both sexes until 10 or 12 years of age, when sex-characteristic adult hormonal profiles emerge. In males, testosterone levels remain relatively constant into senescence, whereas females experience cyclic variations in estrogen and progesterone levels until the menopause, when the levels of both hormones decline markedly.

In early life, brain estrogen exerts a variety of neurotrophic actions that promote neuronal migration, growth, dendritic arborization and spine formation, and survival (*33*). In adolescence a dramatic pruning of synapses takes place. It has been suggested that this triggers the emergence of various disorders, including schizophrenia, attention deficit hyperactivity disorder and Tourette's syndrome. Neurotrophic effects of estrogen may modulate this pruning, and contribute to the increased incidence of Tourette's syndrome and attention deficit hyperactivity disorder in males and to the earlier onset of schizophrenia in males. In women, early puberty and exposure to elevated estrogen are associated with a delayed onset of schizophrenia (*34*). The amelioration of psychotic symptoms during pregnancy and their exacerbation when estrogen levels decline after childbirth suggests that estrogen possesses antipsychotic properties that work through other mechanisms as well. The early course of schizophrenia favours women. After the menopause, however, at an age when the symptoms begin to wane in men, they become more severe in women (*35*).

In addition to its neurotrophic effects, estrogen exerts multiple site-specific effects on certain neurotransmitters, e.g. dopamine, norepinephrine and serotonin, which are involved in mood, appetite, pain and modulation of the glucocorticoid stress response. The effects of estrogen on these neurotransmitters may partly account for the observed gender differences in the incidence of depression, anxiety and somatic disorders, all of which have a lifetime prevalence that is two to three times higher in women than in men, although before puberty there is no difference in prevalence between the sexes (*35*). There is considerable evidence suggesting that the effect of estrogen on serotonin levels accounts for female headache patterns (*36*). During the reproductive years the peak-to-trough changes in estrogen levels cause serotonin concentrations to decrease, thus triggering the headache response. This may explain why migraine does not worsen with the spontaneous onset of the menopause, when, although the estrogen level declines, there is a cessation of cyclical changes in the concentration of this hormone.

Estrogens also reduce the synthesis and storage of amyloid beta which accumulates in Alzheimer's disease and destroys neurons (*35*). Furthermore, estrogens possess antioxidant properties and promote the synthesis of nerve growth factors, modulate levels of antiapoptopic proteins, reduce inflammation and improve blood flow (*35*). The aromatase enzymes in the brain convert testosterone to estrogen. Consequently, in old age as in fetal life, males have more estrogen in the brain than females. Unsurprisingly, therefore, women in old age become more vulnerable than men to neurodegenerative diseases, including alcohol-induced toxicity and Alzheimer's disease (*35*).

## Conclusions

Despite numerous reports of structural and functional gender dimorphisms in the brain, relatively few have been adequately replicated. Moreover, the neuroanatomical bases of the functional differences are poorly understood and most of our knowledge of brain sexual

differentiation has been gleaned from animal research. In animals it is clear that early developmental exposure to androgens and their estrogenic metabolites is a major factor in brain sexual differentiation. However, the role of cell autonomous genetic mechanisms in sexual differentiation is only beginning to be studied. How sexual variation in normal brain development and organization contributes to gender differences in vulnerability to illness largely remains a matter of conjecture. There is considerable evidence suggesting that estrogens, acting through a multiplicity of mechanisms, mediate gender differences in the incidence, age of onset and severity of various brain disorders.

## Epilogue

The conference highlighted not only the magnitude of gender differences in the manifestations and prevalence of particular mental disorders but also how little we know about the origins of those differences. Biological and social contributions are exceedingly difficult to separate in disorders that influence cognition, mood, affect and behaviour. Because we do not wish to posit biological explanations for social phenomena, we must be careful in drawing causal inferences on the basis of correlations between gender differences in the brain and gender differences in its vulnerabilities to particular disorders.

Studies that it has not been possible to replicate and ones that have been inconsistently replicated are prominent in the literature on gender differences. This reflects, in part, the paucity of studies in which the elucidation of gender differences has been the primary aim. Most reports of brain gender differences are derived from studies with other primary aims in which gender has been included as a classification variable, primarily because of its convenience. Other factors that contribute to inconsistencies in the literature include: 1) inadequate control for multiple comparisons, particularly in neuroimaging studies that employ automated parcellation algorithms to delineate multiple brain regions; 2) the use of diverse methodologies in "replication" studies, particularly in the neuroanatomical literature where some authors parcellate the brain on the basis of its gyral patterns and others do so on the basis of cytoarchitectonic considerations; 3) failure to control for the possibility that dependent variables are influenced in women by cyclic hormonal changes.

In the light of the above it is clear that large-scale studies are needed in which the elucidation of gender differences is the primary aim. Regardless of the methodology, these studies should focus on hypothesis-driven planned comparisons and, where appropriate, should assess the possibility of variation with the ovarian cycle in women, particularly if the brain region in question possesses estrogen receptors. A necessary step in understanding how estrogen affects the brain is to compare the distribution of estrogen receptors with that of aromatase enzymes in the human brain. Because men's brains derive estrogen from testosterone through aromatization, regions with both estrogen receptors and aromatase enzymes would be exposed to estrogen in both men and women, whereas receptor-containing regions lacking the enzyme would be exposed only in women. The acquisition of such basic knowledge is clearly necessary in order to gain an understanding of how estrogen contributes to brain gender differences.

The prenatal hormonal hypothesis of brain sexual differentiation is clearly inadequate to explain all brain gender differences. Future studies should consider alternative explanations.

## References


1. Graves JAM. Human Y chromosome, sex determination, and spermatogenesis – a feminist view. *Biology of Reproduction* 2000;63:667–76.
2. Carrel L, Cottle AA, Goglin, KC, Willard HFA. First-generation X-inactivation profile of the human X chromosome. *Proceedings of the National Academy of Sciences of the United States of America* 1999;A96:4440–4.
3. Xu J, Burgoyne PS, Arnold AP. Sex differences in sex chromosome gene expression in mouse brain. *Human Molecular Genetics* 2000;11:1409–19.
4. Zechner U, Wilda M, Kehrer-Sawatzki H, Vogel W, Fundele R, Hameister H. A high density of X-linked genes for general cognitive ability: a run-away process shaping human evolution? *Trends in Genetics* 2001;17:697–701.
5. Chelly J, Mandel JL. Monogenic causes of X-linked mental retardation. *Nature Reviews Genetics* 2001;2:669–80.
6. Bardoni B, Mandel JL, Fisch GS. FMR1 gene and fragile X syndrome. *American Journal of Medical Genetics* 2000;97:153–63.
7. Durston S, Hulshoff HE, Casey BJ, Giedd JN, Buitelaar JK, van Engeland H, et al. Anatomical MRI of the developing human brain: What have we learned? *Journal of the American Academy of Child and Adolescent Psychiatry* 2001;40:1012–20.
8. Dekaban A, Sadowsky D. Changes in brain weights during the span of human life: Relation of brain weights to body heights and body weights. *Annals of Neurology* 1978;4:345–56.
9. Ankney CD. Sex differences in relative brain size: the mismeasure of woman, too? *Intelligence* 1992;16:329–36.
10. Highley JR, Esiri MM, McDonald B, Cortina-Borja M, Cooper SJ, Herron BM, et al. Anomalies of cerebral asymmetry in schizophrenia interact with gender and age of onset: a post-mortem study. *Schizophrenia Research* 1998;34:13–25.
11. Gur RC, Turetsky BI, Matsui M, Yan M, Bilker W, Hughett P, et al. Sex differences in brain gray and white matter in healthy young adults: Correlations with cognitive performance. *Journal of Neuroscience* 1999;19:4065–72.
12. Filipek,PA, Richelme C, Kennedy DN, Caviness VS. The young adult human brain: An MRI-based morphometric analysis. *Cerebral Cortex* 1994;4:344–60.
13. Goldstein JM, Seidman LJ, Horton NJ, Makris N, Kennedy DN, Caviness VS, et al. Normal sexual dimorphism of the adult human brain assessed by *in vivo* magnetic resonance imaging. *Cerebral Cortex* 2001;11:490–7.
14. Frederikse ME, Lu,A, Aylward E, Barta P, Pearlson G. Sex differences in the inferior parietal lobule. *Cerebral Cortex* 1999;9:896–901.
15. Collaer ML, Tory HO, Valkenburgh, M.C. Do steroid hormones contribute to sexual differentiation of the human brain? In: Legato M, editor. *Principles of gender-specific medicine.* San Diego: Elsevier Science; in press.
16. Allen LS, Hines M, Shryne, JE, Gorski RA. Two sexually dimorphic cell groups in the human brain. *Journal of Neuroscience* 1989;9:497–506.

17. Byne, W, Tobet S, Mattiace LA, Lasco MS, Kemether E, Edgar MA, et al. The interstitial nuclei of the human anterior hypothalamus: An investigation of variation with sex, sexual orientation, and HIV status. *Hormones and Behavior* 2001;40:86–92.

18. LeVay S. A difference in hypothalamic structure between heterosexual and homosexual men. *Science* 1991;253:1034–7.

19. del Abril A, Segovia S, Guillamon A. The bed nucleus of the stria terminalis in the rat: Regional sex differences controlled by gonadal steroids early after birth. *Brain Research. Developmental Brain Researchrain* 1987;32:295–300.

20. Springer SP, Deutsch G. *Left brain, right brain*, 4th ed. New York: Freeman; 1989.

21. McGlone J. Sex differences in human brain asymmetry: A critical survey. *Behavioral and Brain Sciences* 1980;3:215–63.

22. Crow TJ. Commentary on Annett, Yeo et al., Klar, Saugstad and Orr: Cerebral asymmetry, language and psychosis − the case for *Homo sapiens*-specific sex-linked genes for brain growth. *Schizophrenia Research* 1999;39:219–31.

23. Bishop KM, Wahlsten D. Sex differences in the human corpus callosum: Myth or reality? *Neuroscience and Biobehavioral Reviews* 1997;21:581–601.

24. Byne W, Lasco MS, Kemether E, Shinawari A, Edgar MA, Morgello S, et al. The interstitial nuclei of the human anterior hypothalamus: An investigation of sexual variation in volume and cell size, number and density. *Brain Research* 2000;856:254–8.

25. Arnold AP, Agate RJ, Carruth LL. Hormonal and cell autonomous mechanisms of sexual differentiation of the brain. In: Legato M, editor. *Principles of gender-specific medicine.* San Diego: Elsevier Science; in press.

26. Cook BM, Tabibnis G, Breedlove SM. A brain sexual dimorphism controlled by adult circulating androgens. *Proceedings of the National Academy of Sciences of the United States of America* 1999;96:7538–40.

27. Allen, LS, Gorski RA. Sex difference in the bed nucleus of the stria terminalis of the human brain. *Journal of Comparative Neurology* 1990;302;697–706.

28. Geshwind N, Behan P. Left-handedness: Association with immune disease, migraine, and developmental learning disorder. *Proceedings of the National Academy of Sciences of the United States of America* 1982;79:5097–5100.

29. Hier DB, Yoon WB, Mohr JP, Price TR, Wolf P. Gender and aphasia in the stroke data bank. *Brain and Language* 1994;47:155–167.

30. Kemether E, Buchsbaum MS, Byne W, Hazlett EA. Magnetic resonance imaging of mediodorsal, pulvinar and centromedian nuclei of the thalamus in patients with schizophrenia. *Archives of General Psychiatry*, in press.

31. Byne W, Stamu C, Parella M, Adams R, Harvey PD, Davis KL. Prevalence and correlates of parkinsonism in chronically institutionalized geriatric patients with schizophrenia. *International Journal of Geriatric Psychiatry* 2000;15:7–13.

32. Goldstein JM, Seidman LJ, O'Brien LM, Horton NJ, Kennedy DN, Makris N, et al. Impact of normal sexual dimorphisms on sex differences in structural brain abnormalities in schizophrenia assessed by magnetic resonance imaging. *Archives of General Psychiatry* 2002;59:154–64.

33. Lee SL, McEwen BS. Neurotrophic and neuroprotective actions of estrogens and their therapeutic implications. *Annual Review of Pharmacology and Toxicology.* 2001;41:569–591.

34. Cohen RZ, Seeman MV, Gotowiec A, Kopala L. Earlier puberty as a predictor of later onset of schizophrenia in women. *American Journal of Psychiatry* 1999;156:1059–64.

35. Seeman MV. Sex differences in psychiatric disorders with a focus on estrogen. In: Legato M, editor. *Principles of gender-specific medicine.* San Diego: Elsevier Science; in press.

36. Marcus DA. Sex hormones and headache. In: Legato M, editor. *Principles of gender-specific medicine.* San Diego: Elsevier Science; in press.

THEME 3:

# IMPLEMENTATION OF GENDER-SENSITIVE MEDICINE

# Introducing a gender perspective in medical curricula: a Swedish experience

**Dr Anna Westerståhl***
Assistant Researcher / Lecturer
Department of Primary Health Care
Göteborg University
Kingdom of Sweden

## Abstract

In Sweden, gender and equal opportunity issues are given high priority, and female politicians have strongly supported women's studies, including women's health studies.

Within the medical faculties, gender issues are lagging behind with respect to research, theory development and implementation in medical education.

In 1999, course organizers from medical departments of the faculty in Göteborg were interviewed about the relevance of a gender issues perspective in their scientific field and how they implemented it in their teaching. Two mutually exclusive standpoints were found: either a gender perspective was considered unscientific and problematic, or it was considered to be of obvious scientific relevance and importance in everyday clinical work. Teaching with a gender perspective was rare, and the course organizers' learning about gender issues was strongly related to the presence of women in the private or professional sphere.

An instructive example of lecturing with a gender perspective is given as part of a full day on the core theme of violence against women. During this day, different professionals and medical students take an active part. The day takes account of the students' eagerness to learn and their desire for hands-on advice to help them in real clinical situations, and acknowledges their emotions and values. The latter is done by value clarification exercises, which are intended to make participants stand up for their beliefs.

Women's knowledge and enthusiasm is of utmost importance when introducing a gender perspective at medical faculties, but this has to be backed up by participation from male colleagues and students and by faculty policy and support.

---

*** Dr Anna Westerståhl** worked as a general practitioner in Göteborg, Kingdom of Sweden. She occupied several positions, including those of Administrative Head of the Primary Health Care Centres at Angered and Kortedala, Göteborg, Head of the Psychosomatic Issues in Primary Health Care Project and Head of the Gender Perspectives on Medical Education Project in Göteborg. Her areas of research include gender issues in medicine and clinical communication. She has published pioneering books including *Medical students learned about a gender perspective* and *Gender in medical curricula: Course organizer's view of a gender-issues perspective in medicine* (2003).

## Keywords

Medical education; Curriculum; Students; Gender; Women's health; Feminism; Interdisciplinary; Value exercise.

## Introduction

In Sweden, gender and equal opportunity issues are given high priority and are, in many ways, mainstream issues. Half of the Government Ministers and 43% of the Members of Parliament are women. Most political parties aim to have equal numbers of female and male candidates, and this goal has been at least partly achieved. Apart from mainstreaming, there are also separate activities directed at women's or men's special interests, e.g. combating violence and harassment against women, decreasing prostitution and upholding the rights of sexual and other minorities. Four ombudsmen are available to provide recourse in the event of infringements of human rights associated with sexual orientation, ethnic background, disability or gender.

The presence of high proportions of women in the Government and Parliament clearly favours the development of health issues linked to women or gender. For 25 years, female politicians have strongly supported the introduction of women's studies, including women's health studies, and they continue to do so.

Nevertheless, progress has been comparatively slow in research and theory development on gender issues and in their introduction into medical education. The proportion of female academic staff in the Medical Faculty of Göteborg University is small (Table 1), whereas the majority of technical and administrative staff are women. This is the case throughout Sweden. Thus the people in key positions are predominantly men. Of course, women do not always support a gender perspective, and it would not be true to say that men never do, but the presence of women has so far proved necessary for progress to occur in this field. Thanks to the efforts of a small and determined minority of female doctors with the political support mentioned above, faculty board resolutions are being passed, recommendations are being made, and projects or other strong local initiatives are being undertaken on gender issues in research and education in every medical faculty in the country.

## Course organizers' views on gender in medical curricula

In 1999 a study on the awareness, knowledge and implementation of a gender perspective was conducted by the Medical Faculty of Göteborg University (*1*). This work was undertaken because a project aimed at introducing discussion on a gender perspective in medical education had progressed extremely slowly and had at times proved very difficult (*2*), and because a faculty recommendation had been made some years earlier concerning the integration of a gender perspective into medical education, although there were no accompanying guidelines and no plan for evaluation.

In a telephone survey, seven female and nineteen male course organizers in preclinical and clinical departments of the faculty were asked if they thought a gender perspective had contributed to their scientific field and, if so, how they implemented it in their teaching

(Box 1). Although the focus of the study was on knowledge and implementation, the results also drew attention to the impact of the course organizers' learning about gender issues. The areas of knowledge and learning emerged as being of particular interest.

Two contrasting standpoints were evident on questions of knowledge (Box 2). The proponents of one standpoint regarded gender issues as different from science and thus problematic, on the basis that in medicine such issues were subjective and therefore biased, irrelevant, disadvantageous, uncomfortable, unscientific and controversial in so far as conclusions were concerned, or, at any rate, were founded on biological differences. People adhering to the other standpoint regarded these issues as being integrated into the application of science and of obvious relevance: an understanding of the significance of gender was said to be crucial for everyday clinical work and for expanding clinical knowledge.

Clearly, these two standpoints are mutually exclusive. Moreover, they shed light on the varied curriculum of medical education and the challenge of including a gender perspective in a curriculum that is already contradictory and difficult to define (*3*).

There was solid evidence that individual females were the source of the male course organizers' learning about gender issues. This was based on living close to women, e.g. having wives, sisters, mothers and daughters who introduced gender issues at home or elsewhere in the private sphere, or on working close to female colleagues who brought up gender equality issues at work, or, sometimes, on long experience with female patients. While the private sphere or equality issues may be the sources from which gender awareness starts, it is essential to gain more scientifically based knowledge about how gender works in medicine and how it is going to be used in teaching. To confine gender issues to the private sphere would be to reduce the importance of this scientific approach and to leave it as a task for women, thus not requiring involvement by men.

These results may also explain why we found it so difficult even to introduce a discussion about gender issues. Lately, however, gender awareness has gained in importance: many academic teachers now realize that it is or should be prioritized and that a gender perspective must, in one way or another, be taken into consideration in medical education. In Göteborg a new faculty board decision has been taken about the integration of gender issues into medical education. There is a detailed plan for its realization and evaluation, although the question of finance is as yet unresolved.

## An educational example

Some seven years ago, in parallel with the above activities, I introduced the subject of violence against women into medical education at Göteborg University. In Sweden the abuse and harassment of women is acknowledged as a topic of major concern and a public health problem. This has recently been a subject of intense debate in the light of a so-called honour killing, threats made by families to young women, and evidence that many Swedish women have experienced physical, sexual or psychological harassment and violence perpetrated by men (*4*, *5*).

I initially lectured in collaboration with a trained social worker from a shelter for battered women. We combined facts, i.e. what was known about prevalence, medical consequences and so on, with feminist theory, mainly as an introduction to the process of internalization of violence (*6*). This multidisciplinary approach was new to the students,

some of whom praised it while others rejected it and said that we were politically and ideologically motivated. Eventually, with the collaboration of other professional colleagues, we developed a one-day session (Box 3) based on the central theme of violence against women. I believe that the key to our success lay in integrating the students' eagerness to learn, their desire for hands-on advice when facing real clinical situations, and an acknowledgment of their emotions and values. The recognition of emotions and values was vital, since medical students are largely subjected to a fact-oriented education in which emotions tend to be suppressed.

The session begins with value clarification. This involves the students taking part in a discussion in which they are encouraged to defend their beliefs (*7*). The students are given the opportunity to take a stand, to express an opinion, to justify a standpoint, to be listened to and to listen to others.

The students are divided into a female group and a male group led by a female teacher and a male teacher respectively. The two groups work independently on two value exercises.

The first exercise is called "the hot seat". The students sit in a circle with the teacher, and there is one empty seat. The teacher presents a series of statements, prepared in advance, and the students are asked to react to each one either by agreeing and changing seats with someone who also agrees or by remaining seated and thus indicating disagreement. The statements do not have to reflect any fact about the problem being addressed but express commonly held values (Box 4). The first statement is seemingly uncontroversial, and in response everybody changes seats. The teacher asks two or three students to explain their standpoints. A brief intense discussion follows, led by the teacher, who remains neutral and presents no facts or information.

A "four corner exercise" follows, in which the students react to a story about violence against women by going to one of four corners, depending on which of four opinions they hold.

A theoretical lecture, based on a case report, is then given by a trained social worker. Most, if not all, of the questions raised by the students during the value exercises are answered or commented on during this talk. In other words, these exercises give rise to very appropriate questions about knowledge issues.

During the afternoon a police inspector, a prosecutor, a doctor specialized in forensic medicine and a general practitioner join in panel discussions with the students.

The full session combines medical knowledge, emotions and values in a manner that overcomes resistance and protests and has become very successful, as indicated by student requests for more of the same.

## Conclusions

Box 5 summarizes some prerequisites for the introduction of a gender perspective into medical curricula.

Individual enthusiasm is important but not enough. A few enthusiasts always risk burning themselves out. Networking and collegial support from other women are crucial

when gender issues are being introduced but, again, are not enough. The participation of men and students is necessary, as are faculty board decisions, thorough evaluation and financial support for a full-scale gender perspective to be introduced.

Every specialty should be required to indicate what it sees as a gender perspective. Apart from the faculty decisions mentioned above, theory development through an interdisciplinary approach and methodological development are essential.

## References


1. Westerståhl A, Andersson M, Söderström M. Gender in medical curricula: Course organizer views of a gender-issues perspective in medicine in Sweden. *Women and Health* 2003;37(4). In press.
2. Wahl A. The cloud – lecturing on feminist research. *Nordic Journal of Women's Studies* 1999;7(2):97–108.
3. Searle J. Introduction of a new curriculum in women's health in medical education: a framework for change. *Women's Health Issues* 1998(8):382–8.
4. French G, Mikaelsson J, Lundgren E. *Captured queen: men's violence against women in "equal" Sweden: a prevalence study.* Uppsala: Uppsala University; 2002.
5. Larsson C, Hensing G, Allebeck P. Sexual and gender-related harassment in medical education and research training: results from a Swedish survey. *Medical Education* 2003;37(1):39–50.
6. Lundgren E. Feminist theory and violent empiricism. Aldershot, United Kingdom and Brookfield, USA: Avebury; 1995.
7. Byreus-Hagen K. *Rubble and roses. A guide for working with girls' groups.* Ljungby: Women's Organizations Committee on Alcohol and Drug Issues; 1996.

**Table 1. Women in politics, Sweden 2001, and in Medical Faculty of Göteborg University, 2002**

| Women in posts | % |
|---|---|
| Government Ministers | 50 |
| Members of Parliament | 43 |
| Academic staff in Medical Faculty of Göteborg University | 19 |

### Box 1. Main questions in interviews

1. Has the current discussion (scientific or popular) of a perspective on gender issues in medicine supplied new knowledge to your medical speciality?
2. If so, how do you use it in your teaching?
3. Do students ask about gender issues in medicine? Are there any differences between questions asked by male and female students?
4. How did you learn about gender issues?
5. Are you interested in learning more about teaching with a perspective on gender issues?

**Box 2. Diversity and boundaries: course organizers' descriptions of gender perspectives in their subject fields**

***Different from (natural) science and problematic***

Practical

Subjective

Uncomfortable

Unscientific

Biologically founded but controversial with respect to conclusions

Founded on biological differences

***Integrated into the application of science and obvious***

Crucial

Important

Obvious

**Box 3. Schedule for one-day session on violence against women**

| | |
|---|---|
| 08:30–10:00 | Value clarification exercise ("hot seat" and "four corners") |
| 10:30–12:15 | The process of normalization – why does a woman not leave her abusive partner? |
| 13:00–16:00 | Panel session with a police inspector, a prosecutor, a doctor specialized in forensic medicine, a general practitioner and a social worker from a women's shelter |
| 16:00–16:15 | Oral evaluation and discussion (students and teachers) |
| 16:15–17:00 | Oral evaluation and discussion (teachers) |

**Box 4. Examples of statements made by teachers in the "hot seat" value clarification exercise**

- Any woman can be battered
- By nature, men are more aggressive than women
- A woman often provokes a man to beat her
- A man may strike when lost for words
- Battering is more common among immigrants than among the indigenous population
- A woman who returns to an abusive relationship has herself to blame
- A battered woman often meets a new abuser

**Box 5. Some prerequisites for introducing a gender perspective into medical curricula**

Women

Individual enthusiasm and skill

Networking and collegial support

Participation of men and students

Faculty decisions, financial support and evaluation

Formulation of a gender perspective for each field

Theory development

Interdisciplinary approach

Methodological development

# Gender and medical education

**Professor Sharon Fonn***
Associate Professor
School of Public Health
University of the Witwatersrand
Republic of South Africa

## Abstract

Making an impact on health status requires that we address health at the population level. The public health approach – determining the size and seriousness of a problem and whether anything can be done about it – guides what issues to tackle. The public health approach also demands that we deal with the root cause of problems. Thus, we have to understand the root causes. Determinants of health are many and interrelated, and importantly they include gender relations. In this paper, evidence was presented to support the notion that if we ignore gender relations we risk promoting a flawed body of medical knowledge, providing students and practitioners with potentially incorrect information and therefore preparing them inadequately to deal with the health problems they will face in their careers. This may result in programmes and policies that have less impact than if they took gender into account. The paper discussed gender relations as forms of consciousness. Exposing this in a constructive manner demands specific training methodologies, and some of these approaches were outlined.

## Keywords

Women, Health status, Public health approach, Determinants of health, Specific training, HIV, Sex and gender differences, Gender inequality on health gender relations.

Those of us concerned with health at the policy and implementation levels – politicians, policy-makers, civil servants, health service managers and members of organized civil society – have to decide what issues to address and in what order, within the limitations of resource constraints and competing demands. This means making decisions on the basis

---

* **Professor Sharon Fonn** is Associate Professor, School of Public Health, University of the Witwatersrand, Republic of South Africa. Her work includes the establishment of an international collaboration leading to a five-year process for developing and testing materials to improve health system functioning and to mainstream gender and rights in health systems. Professor Fonn has worked as an adviser to the World Bank and several UN agencies, including UNFPA. She has been involved in research with a view to policy development and implementation in South Africa. Internationally, she has conducted research in the field of reproductive health. Her unique programme placing gender equity in the mainstream of health care delivery was piloted in two multicountry studies and published as a WHO manual.

Professor Fonn has published many books on women's health, including *Not only what you do, but how you do it: Working with health care practitioners on gender equality.*

of data about how interventions affect the health of populations rather than that of individuals. In order to make choices about what issues to take up the public health approach asks the following questions.

- How big is the problem?
- How serious is it?
- Can something be done about it?

While this method offers a rationale about what issues to take up it does not indicate how to intervene. A progressive public health approach to the development of interventions requires an understanding of the determinants of ill-health, prominent among which are the economic status of individuals and societies, the resources that are available, how they are spent and how spending is organized. The relative inequalities between high and low socioeconomic status frequently determine health status (*1*). In order to improve health, therefore, public health should be concerned with redressing inequity. Economic prosperity is one area of inequity that influences health. There are others, such as rural-urban differences and sex and gender differences, and these often interrelate. Sex and gender differences place men and women at risk of ill-health in various ways (*2*). Women's health status, their economic status, their rights and their responsibilities are structurally different from those of men and systematically increase their vulnerability.

What are gender issues and why should we take them seriously? The term "sex" refers to biological differences between female and male, while "gender" refers to roles that are socially ascribed to female and male behaviours, duties, rights and responsibilities, all of which change from place to place and over time. They reflect social norms and values that are commonly ascribed to men and woman and are taught and reinforced through the family, the educational, legal, religious and economic systems, and the ways in which people relate to each other. This includes how medical professionals relate to each other, to nurses and to patients.

There have been many studies on gender and medicine (*3*, *4*) and on how women's organizations have dealt with the control that a predominantly male profession has exerted over women in the West (*5*) and the East (*6*). Much evidence exists of the impact of gender inequality on health (*7*). If gender issues are ignored the outcomes may include: a flawed body of medical knowledge; students receiving incorrect information; the inadequate preparation of students for work as health care providers; programmes and policies with less impact than they would have if gender were taken into account.

Physiology, anatomy and pharmacology may seem to be neutral topics. However, let us consider the three routes by which absorbtion occurs: breathing, through the skin and eating. This, for example, affects the way toxins are dealt with in the body and the way drugs are metabolized. Often what is not taught in relation to breathing is that men exchange about 50% more air in a given period than women, that pregnant women exchange 70% more air in a given period than non-pregnant women, and that the larger blood flow in men and pregnant women than in non-pregnant women can deliver greater total amounts of toxins to target tissues. In relation to transdermal absorption, sweat may increase the absorption of water-soluble substances and impede that of lipid-soluble substances; men sweat more than women; men have thicker epidermal layers on their upper extremities than women; dermal hydration is greater in men and pregnant women than in non-pregnant women; and dermal blood flow is the same for men and non-pregnant women but greater for pregnant women. In

relation to ingestion, men have higher gastric acidity than women, enhancing the absorption of weak acids and impeding the absorption of weak bases; during pregnancy, food and the products of digestion remain longer in the stomach and intestines because of reduced motility; for the same levels of alcohol intake, even after correcting for body weight, women have higher blood alcohol levels than men; and blood alcohol levels vary with the stage of the menstrual cycle. In relation to metabolism, men have a higher basal metabolic rate than women, and metabolites can be either less or more toxic than their parent compounds (*8*). Most data have been developed for the average man and therefore it is not usually known whether exposures to toxins, drugs and so on are more or less safe for women than for men. Because of the systematic exclusion of women from many drug trials there is comparatively little knowledge of the pharmacokinetics of these substances in women. Side-effect profiles may differ between men and women, yet information derived from trials involving men only is presented as applying to women as well.

Many textbooks state that leprosy and tuberculosis, for example, are more common in men than in women. In relation to infectious diseases, however, studies on gender and sex have brought new knowledge. Since the mid-1980s the number of tuberculosis cases has been increasing in both developing and developed countries, and in 1993 this disease was declared a global emergency by WHO (*9*). Tuberculosis is associated with poor social conditions and it has been estimated that 70% of the world's poor people are women (*10*). Why, then, should more men be infected with *Mycobacterium tuberculosis* than women? A difference in prevalence between males and females only emerges after the age of about 15 years. Once infected with the bacillus only some people develop the disease. It appears that that progression from infection to disease in people aged 10–44 years is 130% higher in women than in men. Yet more men than women are reported as having tuberculosis. It is also noteworthy that more women than men die from the disease (*11*). While we do not understand all the reasons, some of these differences can be explained by biological differences and some by gender differences between men and women. For example women's access to health services has been reported as more restricted than men's. Consequently, many women with tuberculosis may not be diagnosed as having the disease. They may therefore have less access to treatment, with the result that mortality is higher among them than among men. In Thailand the prevalence of malaria is probably the same in men and women but men access services more than women (*12*). Research on leprosy has shown that women are more likely to hide their condition than men (*13*) and that passive case-finding, which relies on people presenting themselves at a health centre, identifies more men than women, whereas door-to-door surveys find more women with the disease than men (*14*). There have been comparable findings on leishmaniasis (*15*). In other words, the information in textbooks about differences between men and women with respect to the prevalence of disease may not be correct.

With regard to noncommunicable diseases the example of myocardial infarction illustrates how inadequate training can affect the health of individuals and populations and how the teaching of medical students may prepare them inadequately for their intended roles. It is commonly thought and taught that heart attacks occur predominantly in men. Yet it has been reported that women doing clerical work who had three children and were married to blue-collar workers had a higher risk of coronary disease than Caucasian male executives (*16*), traditionally considered to be the principal victims of heart attacks. Consequently, it has been suggested, women have not always received optimal treatment (*17*), diagnosis takes longer for women than for men (68 and 9 months respectively in one study) (*18*), they are referred later than men (*19*) and they undergo fewer diagnostic tests (*20*, *21*).

Clearly, then, a satisfactory medical education should include a consideration of the influence of gender on health. Such an education can be expected to result in professionals treating individuals properly and to have a beneficial effect on the health of populations.

In the field of health programming the example of HIV infection is instructive. The transmission of HIV is related to the abilities of individuals to determine if, when, with whom and how they have sex. In most societies, women are at a disadvantage in this regard. They find it difficult to negotiate condom use (*22–25*). High rates of rape (*26*, *27*), including marital rape (*28*), indicate how hard it is for women to control their sexual encounters. Thus HIV programming should deal with women's rights to control their own sexual relations and should reinforce the notion of joint responsibility between individuals for sexual health. Sex would be safer for everyone if the use of condoms were more widespread. In the light of this it is useful to assess how HIV programmes have taken on gender issues.

Attempts have been made to decrease the number of children born with HIV by interrupting transmission *in utero* with antiretroviral treatment during pregnancy and childbirth. This has been called preventing mother-to-child transmission. However this technical approach, looking only at the biological mechanism of infection from mother to child, represents a missed opportunity to deal more holistically with the HIV epidemic. Let us draw an analogy with infant mortality associated with diarrhoea, most commonly caused by bacteria and viruses. In order to tackle these pathogens one could take a technical view, treat with antibiotics or look for a vaccine against viruses. However a multidisciplinary approach has proved more useful, involving good sanitation, adequate water supplies, oral rehydration therapy and the education of carers. A similar approach should be adopted in HIV programmes.

What are the consequences of concentrating on the technical prevention of mother-to-child transmission of HIV? It implies that the mother alone is responsible for her child's infection. Yet we know that women become infected as a result of having sex with an infected individual. Apportioning blame to a woman is neither useful nor accurate: both parents are responsible. It would be more appropriate to talk about parent-to-child transmission rather than mother-to-child transmission. It is important to use language that empowers men as well as women to take responsibility for protecting themselves and their families.

The provision of short-course antiretrovirals to pregnant women can be expected to decrease the number of children born with HIV. However, in order to have an impact on the epidemic overall it is necessary to consider all age groups and to use each intervention against HIV to promote the aims of other such interventions. This requires that men and women take responsibility for their sexual behaviour and its consequences, including being parents to their children whether or not the children are HIV-positive. One way of doing this is to ensure that all programmes promote condom use.

Concern with the prevention of parent-to-child transmission, rather than only with mother-to-child transmission, offers an opportunity to draw men into anti-HIV programmes. For example, men can be invited to attend at least one antenatal care visit with their partners so that they can learn about parent-to-child transmission. They can receive information on testing and on how this can benefit their families in terms of prevention. If they become involved in the antenatal care of their children this may encourage them to participate in postnatal care. In other words the social norm that only women care for children can be challenged.

There is some evidence in Zimbabwe that men would be prepared to use condoms during pregnancy and breast-feeding in order to avoid new infection or reinfection of their partners and thus of their babies (Chitsike, unpublished data, 2001). As 5−10% of pregnant women seroconvert during the year that they are pregnant, and as the risk of parent-to-child transmission rises to 80% during seroconversion, the prevention of new infection or reinfection in women at any time during pregnancy and breast-feeding would be beneficial to them and their children. The use of condoms in these circumstances could increase the acceptability of condom use more generally within relationships and, potentially, in society at large.

Thus there are various ways in which the campaign against mother-to-child transmission of HIV could be made more gender-sensitive. However, despite the claims of UNICEF and other bodies to promote gender-sensitive programming, and the promotion of male involvement by UNAIDS, programmes for the prevention of mother-to-child transmission still exist. The fundamental link between gender inequality and the spread of HIV demands that every opportunity be used to make each intervention gender-sensitive so as to change the discourse and social norms that fuel the epidemic. Referring to parent-to-child transmission rather than mother-to-child transmission seems be in line with this aspiration.

Clearly, data and research on sex and gender differences should be discussed in basic medical education. However, it has to be appreciated that gender relations are predicated on rigid assumptions about what it means to be a woman or a man, valid ways of having relationships, and the rights and entitlements of gendered beings. People are often unaware that they hold these assumptions. It is necessary to show how we impose our own history of relationships on people with whom we interact and to understand that the behaviours in question are not only personal but are also common in society and institutions. The methods of relating are not value-free: they lead to systematic inequalities that extend beyond ourselves. For training purposes it is important to develop learning methods that help to explore how we relate to one another and how these behaviours are patterned. It is essential that training includes opportunities for self-reflection so that we can see ourselves in new ways and imagine new ways of relating. Curricula using such methods have been used by gender trainers (*29*) and development trainers (*30*) in many sectors and have been developed to look at health (*31*), health services (*32*, *33*) and health programming (*34*). An internationally tested curriculum that incorporates this way of teaching has been developed (*35*). It is aimed at health service mangers but the methods are also suitable for undergraduate and postgraduate medical teaching. However, people using this resource require facilitation skills and an understanding of the links between gender and health (*36*). Participatory learning, in which people use their own experience to gain an understanding of gender inequality, linked with factual information, offers the prospect of improving medical education in this field.

I have tried to show that the incorporation of a gender perspective into medical education can produce better graduates and can make it possible to provide improved interventions for individuals and populations. The challenge for all of us is to move from rhetoric to action, to change the way we teach and what we teach.

## References


1. Doyal L. *The political economy of health.* London: Pluto Press; 1979.
2. Doyal L. *What makes women sick: Gender and the political economy of health.* New Brunswick: Rutgers University Press; 1995.
3. Elston MA. Medicine as 'old husbands' tales: The impact of feminism. In: Spender D, editor. *Men's studies modified: the impact of feminism on the academic disciplines.* Oxford, New York: Pergamon Press; 1981.
4. Ehrenreich B, English D. *For her own good. 150 years of the experts' advice to women.* New York: Anchor Books; 1989.
5. Ruzek SB. *The women's health movement: feminist alternatives to medical control.* New York: Praeger; 1978.
6. Ravindran TKS. *Subverting patriarchy: workshops for rural women.* Tamil Nadu: Rural Women's Social Educational Centre.
7. World Health Organization. *Gender and health.* Geneva: World Health Organization; 1998 (WHO Document WHO/FRH/WHD/98.16).
8. Headapohl D. Sex, gender, biology and work. In: Headapohl D, editor. *Women workers occupational medicine state of the art reviews 8.* Philadelphia: Hanley and Belfus Inc; 1993.
9. Thorson A, Diwan VK. Background to gender and tuberculosis workshop: A global public health problem. In: Diwan VK, Thorson A, Winkvist A, editors. *Gender and tuberculosis.* Stockholm: Nordic School of Public Health; 1998.
10. Tinker A, Daly P, Green C, Saxenian H, Lakshminarayanan R, Gill K. *Women's health and nutrition: making a difference.* Washington DC: World Bank; 1994 (World Bank Discussion Papers 256).
11. Dolin P. Tuberculosis epidemiology from a gender perspective. In: Diwan VK, Thorson A, Winkvist A, editors. *Gender and tuberculosis.* Stockholm: Nordic School of Public Health; 1998.
12. Ettling M, Thimasarn K, Krachaiklin S, Bualombai P. Evaluation of malaria clinics in Maesot, Thailand: use of serology to assess coverage. *Transactions of the Royal Society of Tropical Medicine and Hygiene* 1989;83:325–31.
13. Vlassoff C. The gender and tropical diseases task force of TDR: achievements and challenges. *Acta Tropica* 1997;67:173–80.
14. Rao S, Khot S, Walawalkar S, Garole V, Karandikar N. *Differences in detection patterns between male and female leprosy patients in Maharashtra.* Pune: Agha Khan Research Institute; 1996.
15. World Health Organization. *Gender and leishmaniasis in Colombia, a redefinition of existing concepts?* Geneva: World Health Organization; 1996 (Gender and Tropical Disease Resource Paper No. 2).
16. Hall E, Johnson J, Tsou T. Women, occupation and risk of cardiovascular morbidity and mortality. *Occupational medicine: state of the art reviews* 1993;8(4):709–31.
17. Kulbertus H, Legrand V. [Women and cardiovascular diseases, particularly coronaropathies.] *Revue Médicale de Liège* 1999;54(4):244–50. (In French.)

18. Schannwell CM, Schoebel FC, Lazica D, Marx R, Plehn G, Leschke M, et al. [Differences in the clinical performance and initial diagnosis in women with suspected coronary artery disease.] *Deutsche medizinische Wochenschrift* 2000;125(47):1417–23. (In German.)

19. Khan SS, Nessim S, Gray R, Czer LS, Chaux A, Matloff J. Increased mortality of women in coronary artery bypass surgery: evidence for referral bias. *Annals of Internal Medicine* 1990;112(8):561–7.

20. Shaw LJ, Miller DD, Romeis JC, Kargl D, Younis LT, Chaitman BR. Gender differences in the noninvasive evaluation and management of patients with suspected coronary artery disease. *Annals of Internal Medicine* 1994;120(7):559–66.

21. Bergelson BA, Tommaso CL. Gender differences in clinical evaluation and triage in coronary artery disease. *Chest* 1995;108(6):1510–3.

22. Davila YR. Influence of abuse on condom negotiation among Mexican-American women involved in abusive relationships. The Journal of the Association of Nurses in AIDS Care 2002;13(6):46–56.

23. Hawken MP, Melis RD, Ngombo DT, Mandaliya KN, Ng'ang'a LW, Price J, et al. Opportunity for prevention of HIV and sexually transmitted infections in Kenyan youth: Results of a population-based survey. Journal of Acquired Immune Deficiency Syndromes 2002;31(5):529–35.

24. Maharaj P. Obstacles to negotiating dual protection: perspectives of men and women. *African Journal of Reproductive Health* 2001;5(3):150–61.

25. Blanc AK, Wolff B. Gender and decision-making over condom use in two districts in Uganda. *African Journal of Reproductive Health* 2001;5(3):15–28.

26. Ajuwon AJ, Olley BO, Akin-Jimoh I, Akintola O. Experience of sexual coercion among adolescents in Ibadan, Nigeria. *African Journal of Reproductive Health* 2001;5(3):120–31.

27. Jewkes R, Abrahams N. The epidemiology of rape and sexual coercion in South Africa: an overview. *Social Science and Medicine* 2002;55(7):1231–44.

28. Basile KC. Prevalence of wife rape and other intimate partner sexual coercion in a nationally representative sample of women. *Violence and Victims* 2002;17(5):511–24.

29. Willliams S, Seed J, Mwau A. *The Oxfam gender training manual.* Oxfam;1995.

30. Hope A, Timmel S. *Training for transformation.* (Volumes 1, 2 and 3.) Harare: Mambo Press; 1984.

31. Hartigan P, Gomez E, da Silva J, de Schutter M. *Workshop on gender, health and development: facilitator's guide*. Washington DC: Pan American Health Organization; 1997.

32. Fonn S, Xaba M. *Health workers for change.* Geneva: WHP/World Health Organization 1996.

33. Varkey SJ, Fonn S, Ketlhapile M. *Health workers for choice.* Johannesburg: Women's Health Project; 2001.

34. Klugman B, Fonn S, Tint KS. *Reproductive health for all.* AIDOS Italy and Women's Health Project South Africa; 2001.

35. Cottingham J, Fonn S, Garcia-Moreno C, Gruskin S, Klugman B, Mwau A, et al. *Transforming health systems: gender and rights in reproductive health.* Geneva: World Health Organization; 2001.

36. Fonn S. Not only what you do, but how you do it: Working with health care practitioners on gender equality. *Women and Health* 2003;37(4). In press.

# The dawn of gender-sensitive medicine in Japan

**Dr Keiko Amano***
Director
Chiba Prefectural Institute of Public Health
Japan

## Abstract

Gender-sensitive medicine began in Japan in 1999. At the 45th Annual Convention of Japanese Colleges of Cardiology, Amano reported on gender-sensitive medicine in the United States of America to the participants and asked them to collect scientific evidence of sex and gender differences throughout the life span in Japanese women. A solid response coincided with the acceptance of evidence-based medicine in Japan. In 2001, Professor C. Tei of Kagoshima University started a clinic for women's health care based on gender-sensitive medicine. Also in 2001 the newly elected Governor of Chiba Prefecture, Akiko Domoto, began working towards the establishment of a women's health care clinic, and Togane Hospital opened such a clinic in September of that year. Counselling services are now available in public health centres and several epidemiological studies are being conducted in Chiba. The number of women's clinics in Japan which advocate gender-sensitive medicine is rapidly increasing.

## Keywords

Gender-sensitive medicine; USA; Women's clinic; University hospital; Prefectural hospital; Public health service centre; Epidemiological.

In 1992 a female patient complaining of uncontrollable chest pains was referred to me. These pains had started when she was 40 and gradually became worse. They occurred during both rest and exercise, especially when she was physically and mentally tired. All laboratory findings, including those of coronary angiography, were normal. Nitroglycerine was ineffective. Her menopause began at 50 and the chest pains were most severe for the following three years. The pains occurred even during the performance of ordinary daily tasks, e.g. shopping, house cleaning and cooking. The patient was almost bedridden. However, a new calcium antagonist, Herbesser, provided some relief. When she was 56 the chest pains spontaneously disappeared and did not return. Subsequently I saw many similar cases, some of which had repeated coronary angiography (CAG), on the basis of which no

---

*** Dr Keiko Amano**, Director of Chiba Prefectural Institute of Public Health, graduated from the Faculty of Medicine, University of Tokyo. Dr Amano has received several awards from the Japanese College of Cardiology, including the Ueda Hideo Prize (1990). She is a member of several academic associations, including the Japanese Society of Internal Medicine. She is Advising Doctor, Japanese Society of Sonographers, and Chairperson of the Council of Health Management Facilities, National University.

useful advice could be given.

Microvascular constriction is now being considered as a possible cause of this kind of chest pain. More studies should be conducted on the pathophysiology of chest pain in women. In 1993 and 1995, reviews in the *Journal of the American Medical Association and Science* made me realize that the concept of gender-sensitive medicine was rapidly gaining ground in the USA. In 1995 I began publishing articles on the differences in disease between men and women. During a symposium entitled *Ischaemic heart disease in Japanese women* at the 45th Annual Convention of Japanese Colleges of Cardiology in 1999 I reported on gender-sensitive medicine in the USA and asked the participants to begin collecting scientific evidence of sex and gender differences throughout life. There was a good response, coinciding with the acceptance of evidence-based medicine in Japan. Professor C. Tei of Kagoshima University asked me to give a lecture on this issue and in 2001 a clinic for women's health care throughout life, based on gender-sensitive medicine, was opened at this university. This was the first venture of its kind in a national university. The operational policy was as follows.

1. Thirty minutes should be spent on the first medical examination.
2. Any complaint or request to examine symptoms should be welcomed.
3. A letter of introduction from other doctors is unnecessary.
4. The physician in charge should be female and a doctor should see each patient individually at every visit.

In March 2001 the newly elected Governor of Chiba Prefecture, Akiko Domoto, began establishing a women's health care clinic in this prefecture. Seminars were organized for nurses and doctors and interview sheets and guidance pamphlets were produced for outpatients. The clinic, which opened in September 2001 in Togane Hospital with a supplementary budget of 60 million yen, was the first of its kind in a prefectural hospital. At the time of opening, appointments at the clinic were fully booked for a period of four months. In December 2001 the *Japan / United States Medical Symposium — Gender and Health in the 21st Century* and a symposium entitled *Women's Health and Care in the 21st Century: Chiba* were held. Professor Marianne J. Legato and her colleagues attended both of these symposia, which attracted the attention of press and public.

Two additional Chiba prefectural hospitals opened women's clinics in 2002 and 2003, and others have been opened in Chiba by Juntendo University Hospital, two national health insurance hospitals and one private hospital, with financial support from Chiba Prefecture. There is a heavy demand for outpatient appointments at all of the women's clinics. Indeed, the clinics are fully booked for three or four months ahead. Figs. 1 and 2 show what Togane Hospital women's clinic has achieved. Some 58% of the patients have been women aged over 50 years. Half of the patients had symptoms attributable to the menopause and 40% of them were prescribed Kanpo. More than 90% of the patients were satisfied with the services received.

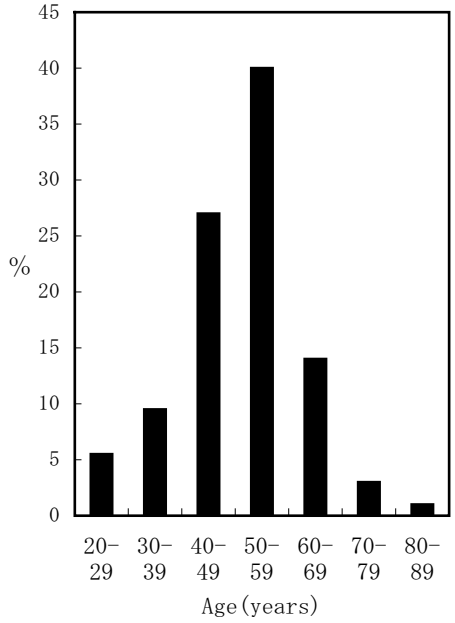
In Chiba, 15 prefectural health centres introduced counselling by female doctors in April 2002 and an unexpectedly large number of women asked to use this service. Epidemiological studies are now being conducted in the prefecture. A large observational study in Asian Women Association comprises a retrospective programme and a prospective one. The retrospective programme concerns the present condition of subjects who had annual health check-ups in 1984–1986 (16 604, 18 847 and 20 088 in 1984, 1985 and 1986

respectively). The prospective programme will deal with about 50 000 people aged 40–89 in 2003 who are covered by national health insurance. In 2003 the basic research on the background of these people will involve the use of a specially designed questionnaire. The budget for this programme is supported by Chiba Prefecture and the Ministry of Health, Labour and Welfare.

The number of women's clinics in Japan which are advocating gender-sensitive medicine is rapidly increasing. Women living in various regions have organized campaigns in which signatures are collected in support of the opening of women's clinics in prefectural hospitals. Toyama City, Osaka Prefecture, Osaka City, Kagoshima Prefecture and Gifu Prefecture have already inaugurated women's clinics in their prefectural hospitals. In Tokyo Metropolis, Kanagawa Prefecture, Nagano Prefecture, Hiroshima Prefecture, Kouchi Prefecture, Yamaguchi Prefecture and Nagoya City, preparations are in progress for setting up such clinics. Moreover, 20 other hospitals that are the medical pivots of regional health services have already inaugurated women's clinics. On average, two hospitals are opening women's clinics every month. The Office of Women's Health in the Department of Health and Human Services is endeavouring to redress inequities in research, health care services, policy, and public and health care professional education in conjunction with agencies of the Department which are collaborating with government organizations and consumer and professional health care groups. The National Centres of Excellence in Women's Health, nominated by the Department and located in leading academic health centres across the North America, are exploring whether women's health can be a model for a more coordinated, informed and accountable system of health care. The present situation in Japan is similar to that which prevailed in women's clinics or hospitals in the USA in the early 1980s.

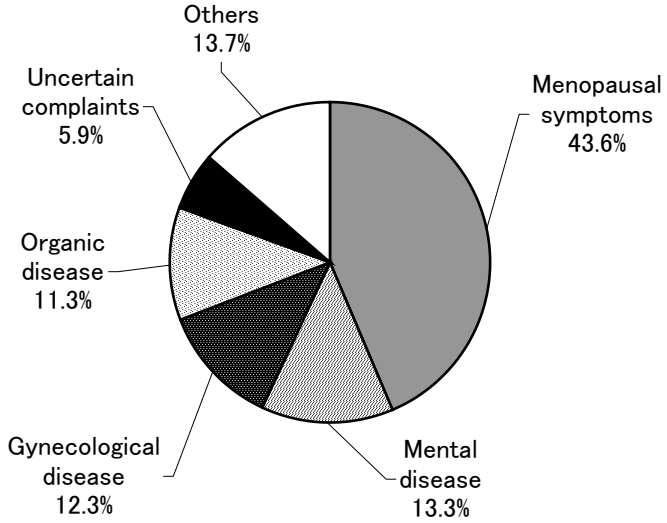
There has been an explosive growth of biological information during the past decade, largely because of the development of highly advanced techniques. Consequently, there is abundant scientific evidence of the importance of sex and gender differences. There are excellent teachers in Canada, Europe and the USA who are forging ahead in women's health and gender-sensitive medicine. In Japan we have to catch up with them and thereby further improve health care for both men and women.

**Fig. 1. Age distribution of outpatients at Togane Hospital women's clinic**




*Togane Hospital, September 2001-August 2002*

**Fig. 2. Diagnosis of outpatients at Togane Hospital women's clinic**




*Togane Hospital, September 2001-August 2002*

# Approach to gender-specific medicine in the Ministry of Health, Labour and Welfare, Government of Japan

**Ms Kimie Iwata***
Chief of Equal Employment, Children and Families Bureau
Ministry of Health, Labour and Welfare
Japan

## Abstract

This paper gives an overview of the approach of the Ministry of Health, Labour and Welfare (MHLW) to gender-specific medicine. It shows the transition from the former "maternal and child health" approach to medical services for women to a "reproductive health rights" approach (based on women's health throughout the life span), and to the perspective of gender specific medicine.

Services for maternal and child health were organized before the second world war, aiming to lower the infant mortality rate, and these made significant achievements. Today, the relevant authorities and organizations have coordinated their approach to this issue, under the theme "Healthy mother and child in the 21st century". This addresses primary care approaches for maternal and child health in the 21st century.

Several steps have been taken to introduce the concept of reproductive health rights – as advocated by the United Nations International Conference on Population and Development in 1994 in Cairo, Egypt, and the United Nations Fourth World Conference on Women in 1995 in Beijing, China – into the Basic Plan for Gender Equality which is a part of the formation of a gender equal society.

In the 1990s, medical research on women made substantial progress in the United States of America. In Japan, several health care professionals began to raise issues concerning routine medical treatments that had not been giving consideration to gender differences. Great emphasis was put on health-related education throughout women's lives, the establishment of support systems, studies on gender differences in lifestyle-related risk factors, and gender-sensitive pharmacotherapy.

Recently, outpatient clinics targeting women are being established in national and prefectural hospitals and private clinics. Following the opening of the National Yokohama Hospital and the National Shimonoseki Hospital, the MHLW is planning to open an outpatient clinic in the National Research Institute for Child Health and Development in the fiscal year 2003, in order to provide a continuing holistic medical service that responds to both physical and mental characteristics specific to women.

---

*** Ms Kimie Iwata** is Director-General of the Equal Employment, Children and Families Bureau, Japanese Ministry of Health, Labour and Welfare. She is a graduate of the Department of Liberal Arts and Science, Tokyo University. Ms Iwata has held various positions related to women's affairs at the national and international levels, including secondment to the Directorate of the Organization for Economic Cooperation and Development.

## Keywords

Women's health, Welfare, Gender-specific medicine, Maternal and child health, Promotion of health education, Quality of life, Women-only outpatient clinic, Women's clinics.

## Introduction

I would like to express my appreciation to the WHO Centre for Health Development (WHO Kobe Centre – WKC) (Dr Kawaguchi, Director) and the Chiba Prefectural Government (Governor Domoto) for their approach to "Women's health issues throughout their lives".

Dr Kawaguchi, Director of WKC, organized several international conferences on this theme for scholars, health care professionals and government officials, which have been very influential in Japan and abroad.

Ms Domoto, Governor of Chiba Prefecture, took the initiative in promoting reproductive health rights as a member of the Diet. Once she took office as Governor of Chiba Prefecture she undertook projects to open a women-only outpatient clinic in a Chiba Prefectural hospital and to offer a health consultation service for women at public health centres, developing a model in this field nationwide.

But for the efforts of these two persons, today's symposium would not have been possible.

## From maternal and child health care to reproductive health rights, women's health promotion throughout their lives, and gender-specific medicine

### *Maternal and child health*

The Ministry of Health, Labour and Welfare has a division that promotes maternal and child health measures. Japanese maternal and child health policy has conventionally concentrated on reducing maternal and infant mortality and preventing disease. There have been remarkable achievements in these areas. Women's health, however, has been perceived primarily from the viewpoint of mother and child.

The Government's maternal and child health services now cover a wide range of areas, including medical care during pregnancy/childbirth, paediatric medical care, adolescent health, and, as from in November 2000, *Sukoyaka* (healthy and happy) Family 21, a vision of major initiatives to be taken in the 21st century concerning maternal and child health, laid out as a national campaign to be promoted through collaboration between relevant parties and organizations.

Under *Sukoyaka* Family 21, the following four major agenda items were established.

- Enhancement of health measures and promotion of health education for adolescents.

- Securing safety and comfort during pregnancy and childbirth, and infertility support.
- Creation of an environment for maintaining and improving the standards of child health and medical care.
- Facilitation of trouble-free mental development of children and alleviation of anxiety about child-rearing.

Goals to be achieved by 2010 have been set for each of these items.

### *Support for women's health throughout their lives*

Meanwhile, as a result of the Cairo International Conference on Population and Development in 1994 and the Beijing World Conference on Women in 1995, the concept of reproductive health rights was adopted in Japan. People have become more aware that women face health problems different from those of men throughout their lives rather than only during pregnancy and childbirth. In the Basic Plan for Gender Equality formulated by the Government in 2000, one of the eleven chapters is devoted to "Support for women's health throughout their lives". We have been preparing to construct an appropriate system to handle issues at the various stages of women's lives, i.e. not only pregnancy and childbirth but also adolescence, the menopause and advanced age. This involves, for example, the improvement of sex education in schools, support for health promotion among adults and elderly people, the alleviation of menopausal symptoms and the promotion of preventive measures against uterine cancer, breast cancer and osteoporosis.

Moreover, in 1996, as part of the project for supporting women's health throughout their lives, the former Ministry of Health and Welfare started subsidizing health consultation services for women at public health centres run by prefectural governments. However, as of January 2003, only 25 of the 47 prefectural governments were providing such a service. We hope that more will become actively engaged in this work.

### *Gender-specific medicine*

I learned the term "gender-specific medicine" from Ms Domoto, Governor of Chiba Prefecture, who visited the Ministry of Health, Labour and Welfare after taking office in spring 2001. I came from the former Ministry of Labour and had just been appointed Chief of the Equal Employment, Children and Families Bureau of the Ministry of Health, Labour and Welfare. This Bureau was formed by the integration of the Ministry of Health and Welfare's Children and Families Bureau, containing the Maternal and Child Health Division, with the Ministry of Labour's Women's Bureau. I lost no time in inviting Dr Keiko Amano, Director of the Chiba Prefectural Institute of Public Health, and Professor Hiroko Hara of the University of the Air, to the Ministry so that I and my staff could learn about reproductive health rights and gender-specific medicine. In December 2001 I also attended the *Japan / United States Medical Symposium – Gender and Health in the 21st Century* organized by Ms Mitsuko Shimomura, President of the Tokyo Kenbikyoin Foundation.

As a result I learned the following facts.

1. Apart from the fact that only women have the ability to become pregnant and give birth to children, there are differences between women and men in the structure of the body, the physical constitution and the functioning of hormones. Consequently,

the causes of disease, the subjective symptoms, the diagnostic criteria and the methods of medical care are essentially different between men and women.

2. In conventional medicine, drugs have been developed and diagnostic criteria and treatment methods have been devised primarily by using male subjects as models.

The Ministry of Health, Labour and Welfare is currently promoting evidence-based medicine. The scientific incorporation of a gender perspective in medical care by fully recognizing gender differences is an issue of evidence-based medicine, and I believe that this will be a boon to men as well as women in terms of health and medical care. It is also considered important for supporting women's health throughout their lives.

## The current status of gender-specific medicine in Japan

### *Approach in the research field*

I thought about what I could do to promote gender-specific medicine in Japan. Within the Ministry of Health, Labour and Welfare, other than the Maternal and Child Health Division of the Equal Employment, Children and Families Bureau where I serve as Chief, many bureaux such as the Health Policy Bureau, the Health Service Bureau and the Pharmaceutical and Medical Safety Bureau are involved in health and medical care. Consequently, the cross-functional theme of reproductive health rights, let alone gender-specific medicine, has not been sufficiently promoted. Indeed, the concept of gender-specific medicine is not yet fully understood.

Against this background I decided to start with basic research, specifically a medical and sociological study on issues of women's health care in Japan and research on the assessment of gender-specific fitness and the measurement of lifestyle, to be conducted for three years from 2002. I was able to secure an annual budget of 10.5 million yen, mainly for collecting epidemiological data in order to establish a basis for gender-specific medication therapy. This research will be conducted jointly with the budget of the Chiba Prefectural Government of Governor Domoto, and Dr Keiko Amano has assumed the position of Chief Researcher.

I hope that recommendations will emerge from this research for promoting gender-specific medicine in Japan, in relation to:

1. the administrative structure;
2. the research system;
3. medical care;
4. the rules for drug development;
5. education/training in gender-specific medicine for physicians, etc.

Other research in gender-specific medicine includes the following.

- Research on the creation of a system for health education/support throughout women's lives, to be conducted for two years from 2001, for which a budget of 10 million yen has been secured. The aim is to build a comprehensive practice model for women's health support throughout their lives, e.g. by summarizing typical

textbooks on gender-specific medicine used in the United States of America and Europe.

- Research on the enrichment of health education/consultation and support for health management/maintenance and promotion throughout life, to be conducted for three years from 2002, for which a budget of 10 million yen has been secured. It is intended to perform a follow-up study on gender differences in risk factors related to lifestyle.

Thus the Ministry of Health, Labour and Welfare has initiated research in gender-specific medicine. The Ministry's response to the recommendations that are made will be crucial. In the research stage it was possible for my Bureau to take the initiative, while in the stage of implementation it is essential for many bureaux within the Ministry and other relevant organizations to be engaged. As from now it is therefore necessary to consider how to progress activities related to gender-specific medicine in collaboration with the relevant departments/bureaux and organizations.

## Women's clinics

### *The current situation in Japan*

In Japan, national university hospitals, prefectural hospitals and private clinics have recently opened women's clinics, and this trend is expected to increase in future. The fact that patients have to wait several months for a clinic appointment demonstrates the strong demand for and high expectations of these clinics.

Women's clinics have the following features.

1. The staff are very familiar with diseases that are either peculiar to women (e.g. menopausal symptoms) or more prevalent in women than in men.
2. In circumstances where it is difficult to treat patients as whole persons because doctors are specialized in relation to particular organs, women's clinics offer comprehensive medical care, giving patients medical treatment including mental care instead of examining patients partially, e.g. the provision of team medical care by doctors in various specialized fields as required.
3. It is possible to discover a patient's feelings and the background of the disease in question by taking 30 minutes or more to listen to the patient carefully at the first visit.
4. The doctors treat patients empathetically, putting themselves in the position of the patients and rejecting the traditional hierarchical relationship between doctor and patient.

As described above, reproductive health rights and gender-specific medicine are practised in women's clinics. This also means the implementation of solutions to problems in Japanese medical practice, e.g. the referral of patients to various departments, waits of three hours for three-minute consultations, and the hierarchical relationship between doctor and the patient. Medical practice as a whole is thus reformed for both men and women.

### *Examples of women's clinics*

National hospitals

Following the opening of a women's clinic in the National Yokohama Hospital in 2001 and in the National Shimonoseki Hospital in 2002, the Ministry of Health, Labour and Welfare has decided that in 2003 such a clinic will be opened in the National Centre for Child Health and Development, a core medical institution for child health care in Japan, in order to handle physical/psychological characteristics peculiar to women and to provide comprehensive medical services for women on a continuous basis. A pilot study will be conducted in this outpatient clinic and research on its effects will be carried out. It is expected that a wealth of data on gender-specific medicine will accumulate.

Rosai hospitals (hospitals for workers' accidents)

Recently, because of an increasing number of women working in different positions and workplaces, advances in industrial technologies and changes in the working environment such as restructuring, more and more women have been complaining about diseases peculiar to women, e.g. menopausal symptoms and abnormal conditions of the mind and body such as techno-stress. Moreover, women are often reluctant to consult a male physician about diseases peculiar to women and are likely to delay visiting a hospital, which results in a worsening of their symptoms. In order to handle such issues, working women's comprehensive outpatient clinics with female doctors were opened in Kanto Rosai Hospital and Chubu Rosai Hospital in 2001. Rosai hospitals are funded by workers' accident compensation insurance, are specialized in dealing with workers' accidents and occupational diseases, and are also involved in workers' health issues. Such clinics will gradually be introduced in other Rosai hospitals.

In addition to these working women's comprehensive outpatient clinics, a working women's medical centre has been set up in each of six Rosai hospitals since 1997, aiming to provide counselling on working women's mental health problems related to family/child care/workplace and to conduct research on women's health in relation to their work, as well as diagnosis and treatment of diseases peculiar to women. These centres support comprehensive health management for working women, covering prevention, treatment and return to work, in close collaboration with relevant hospital departments, industrial physicians, etc.

## Conclusion

Women's health, i.e. well-being, throughout their lives is a matter of the quality of their lifestyles. The Ministry of Health, Labour and Welfare has been extensively involved in women's way of life, including not only medical and health services but also working women's issues, e.g. equal employment opportunities, support for managing both a career and child-rearing, the issue of domestic violence, and family problems such as those of single-mother families. We wish to continue promoting women's health on this broad basis.

# ANNEXES

# Annex 1: Preliminary announcement

## Background

The WHO Centre for Health Development (WHO Kobe Centre – WKC), with the support of Chiba Prefecture and other bodies, is organizing the International Symposium on Gender-Sensitive Medicine as a follow-up to important issues addressed at WKC's Third International Meeting on Women and Health held in Kobe, Japan from 8 to 10 April 2002.

The Symposium will focus on gender-sensitive medicine with special reference to gender-sensitive practices in women's clinics in several parts of the world, including Chiba Prefecture, Japan. While health policy development has increasingly taken into consideration the determinants of health and different ways of addressing health inequalities, insufficient attention has been given to the gender-specific aspects of health determinants. Consequently, opportunities have been missed to improve women's health because of inappropriate treatment in gender-blind health care delivery services. For example, recent studies on coronary disease have made it clear that biological differences between women and men go beyond reproductive health and indicate the need for a gender perspective in health. Gender-specific medicine alone is not sufficient: a gender perspective is also needed in health care and health policy implementation in order to achieve gender-sensitive medicine of high quality. The Symposium will go beyond the epidemiological aspects of gender specificity in medical research and will cover issues of gender awareness in health services and health welfare systems. Consequently, the meeting will use the terminology of gender-sensitive medicine.

The Symposium will provide an opportunity to present and discuss these matters on the basis of the available evidence and examples of existing practices of gender-sensitive medicine. It will bring together decision-makers, experts in gender-sensitive medicine and researchers to address strategies for introducing a gender perspective in health and translating these into gender-sensitive health-related policies and action.

## Symposium objectives

1. To facilitate knowledge transfer through an exchange of information on research outcomes in gender-sensitive medicine by experts from countries in different parts of the world.
2. To stimulate research collaboration through the exchange of information.
3. To collect and disseminate information on good practices in gender-sensitive medicine.
4. To influence the incorporation of a gender perspective into the development of health policies.

## Expected outcomes

1. The promotion of a better understanding of gender-sensitive medicine, practices, strategies and policies.
2. The transfer of knowledge between stakeholders.

3. The production of technical documents on evidence-based research in gender-sensitive medicine and examples of the introduction of a gender perspective in medical curricula and health care.

## Participants

The participants will include policy-makers, decision-makers, leading international experts and researchers in the field of gender-sensitive medicine, and representatives from relevant health-related organizations.

## Date and venue

The Symposium will take place on 1 March 2003 at the International Conference Hall, Makuhari Messe, Chiba Prefecture, Japan.

# Annex 2: Programme

| | |
|---|---|
| 08:30–09:30 | Registration |

**09:30–11:15 OPENING CEREMONY**

| | |
|---|---|
| 09:30–10:10 | Welcoming remarks:<br>Dr Yuji Kawaguchi, Director, WHO Kobe Centre<br>Ms Akiko Domoto, Governor, Chiba Prefecture, Japan<br><br>Messages:<br>Dr Taro Nakayama, Member, House of Representatives, Japan<br>Ms Mariko Bando, Director-General, Gender Equality Bureau, Cabinet Office, Government of Japan |
| 10:10–10:25 | Group photograph |
| 10:25–10:45 | Coffee Break |
| 10:45–10:55 | Outline of the purposes of the meeting and nomination of the Chairperson and meeting officers<br>Adoption of the agenda by the Chairperson<br><br>Chairperson:<br>Professor Yasuyoshi Ouchi<br>Reproductive, Developmental and Aging Science, Graduate School of Medicine, University of Tokyo, Japan<br><br>Co-Chairperson:<br>Dr Keiko Amano<br>Chiba Prefectural Institute of Public Health, Japan<br><br>Moderators:<br>As below<br><br>Rapporteurs:<br>Dr Aizan Hirai<br>Togane Hospital, Chiba Prefecture, Japan<br>Dr Toni Schofield<br>School of Behavioural and Community Health Sciences, Faculty of Health Sciences, University of Sydney, Australia |
| 10:55–11:15 | Overview of the Women and Health Programme of WHO Kobe Centre |

**11:15–12:05 PLENARY SESSION 1**

**Theme 1: Gender-sensitive medicine**

Moderator:
Professor Yasushi Saito
Department of Clinical Cell Biology
Graduate School of Medicine, Chiba University, Japan

11:15–11:35 *Women's health in the 21st century: moving towards sex based biology / gender specific medicine Gender-specific medicine*
Dr Marianne J. Legato
Partnership for Gender-Specific Medicine
Columbia University, USA

11:35–11:55 *Why gender-based medicine is good medicine*
Professor Jill Astbury
Key Centre for Women's Health in Society
University of Melbourne, Australia

11:55–12:05 Discussion

12:05–13:35 Lunch

**13:35–14:25 PLENARY SESSION 2**

**Theme 2: Research on gender-sensitive medicine**

Moderator:
Professor Masako Matsuda
Faculty of Health Sciences
Yamaguchi University School of Medicine, Japan

13:35–13:55 *The clinical features of women with variant angina pectoris*
Dr Hiroaki Kawano
Department of Cardiovascular Medicine
Kumamoto University School of Medicine, Japan

13:55–14:15 *Gender differences in the brain and its vulnerabilities to illness*
Dr William Byne
Laboratory of Neuroanatomy
Mount Sinai School of Medicine, USA

14:15–14:25 Discussion

**14:25–15:55 PLENARY SESSION 3**

**Theme 3: Implementation of gender-sensitive medicine**

Moderator:
Dr Chuwa Tei
First Department of Internal Medicine
Kagoshima University Faculty of Medicine, Japan

14:25–14:45 *Introducing a gender perspective in medical curricula: A Swedish experience*
Dr Anna Westerståhl
Department of Primary Health Care
Göteborg University, Sweden

14:45–15:05 *Gender and medical education*
Professor Sharon Fonn
School of Public Health
University of the Witwatersrand, South Africa

15:05–15:25 *The Ddawn of gender-sensitive medicine in Japan*
Dr Keiko Amano
Chiba Prefectural Institute of Public Health, Japan

15:25–15:45 *Approach to gender-specific medicine in the Ministry of Health, Labour and Welfare, Government of Japan*
Ms Kimie Iwata
Equal Employment, Children and Families Bureau
Ministry of Health, Labour and Welfare, Japan

15:45–15:55 Discussion

15:55–16:15 Coffee break

**16:15–16:55 PLENARY SESSION 4**

**General discussion and conclusions**

16:15–16:35 Discussion

16:35–16:55 Conclusions

**16:55–17:15 CLOSING SESSION**

Ms Akiko Domoto, Governor, Chiba Prefecture, Japan
Dr Yuji Kawaguchi, Director, WHO Kobe Centre

# Annex 3: List of participants

**Temporary Advisers**

Dr Keiko Amano, Director, Chiba Prefectural Institute of Public Health, Chiba, Japan

Professor Jill Astbury, Acting Director / Associate Professor, Key Centre for Women's Health in Society, University of Melbourne, Melbourne, Australia

Dr William Byne, Director, Laboratory of Neuroanatomy, Mount Sinai School of Medicine, New York, United States of America

Professor Sharon Fonn, Acting Head, School of Public Health, University of the Witwatersrand, Johannesburg, Republic of South Africa

Dr Aizan Hirai, Director, Togane Hospital, Chiba Prefecture, Chiba, Japan

Ms Kimie Iwata, Director-General, Equal Employment, Children and Families Bureau, Ministry of Health, Labour and Welfare, Tokyo, Japan

Dr Hiroaki Kawano, Assistant Professor, Department of Cardiovascular Medicine, Kumamoto University School of Medicine, Kumamoto, Japan

Dr Marianne J. Legato, Professor of Clinical Medicine, Partnership for Gender-Specific Medicine, Columbia University, New York, United States of America

Professor Masako Matsuda, Faculty of Health Sciences, Yamaguchi University School of Medicine, Yamaguchi, Japan

Professor Yasuyoshi Ouchi, Reproductive, Developmental and Aging Science, Graduate School of Medicine, University of Tokyo, Tokyo, Japan

Professor Yasushi Saito, Department of Clinical Cell Biology, Graduate School of Medicine, Chiba University, Chiba, Japan

Dr Toni Schofield, Senior Lecturer, School of Behavioural and Community Health Sciences, Faculty of Health Sciences, University of Sydney, Sydney, Australia

Dr Chuwa Tei, Professor, First Department of Internal Medicine, Kagoshima University Faculty of Medicine, Kagoshima, Japan

Dr Anna Westerståhl, Assistant Researcher / Lecturer, Department of Primary Health Care, Göteborg University, Göteborg, Kingdom of Sweden

**Participants**

Dr Noriko Akiba, President, Chiba Medical Association, Chiba, Japan

Dr Miwa Akizuki, Japanese Red Cross Kumamoto Health Care Centre, Kumamoto, Japan

Ms Ryuko Aoki, Director, Kagoshima Television Station, Kagoshima, Japan

Dr Takuya Aoki, Deputy Head, Saiseikai Central Hospital, Tokyo, Japan

Dr Yoko Araki, Director, NTT East Co. Shutoken Health Administration Centre, Tokyo South Branch, Tokyo, Japan

Dr Ryoko Dozono, Director, International Medical Crossing Office, Tokyo, Japan

Dr Viveka Enander, Freelance Lecturer / Crisis Therapist, Göteborg, Kingdom of Sweden

Mrs Makiko Fuyama, Ichiba Clinic, Chiba, Japan

Dr Chieko Hamada, Assistant Professor, Juntendo University, Tokyo, Japan

Dr Tomoko Hayano, Medical Director, Department of General Medicine for Women, National Shimonoseki Hospital, Yamaguchi, Japan

Dr Mayumi Higurashi, Chiba University Hospital, Chiba, Japan

Dr Reiko Hirose, Gifu Prefectural Hospital, Gifu, Japan

Ms Masae Honma, Staff Writer, Science News Department, Yomiuri Shimbun, Tokyo, Japan

Mr Shinji Iijima, Assistant Manager, Medical Division, Health and Welfare Department, Yamanashi Prefecture, Yamanashi, Japan

Ms Bennie Inouye-Nagao, President, Eureka Japon, Inc., Tokyo, Japan

Professor Kazuko Ishigaki, Chiba University School of Nursing, Chiba, Japan

Mrs Noriko Ishikawa, Head Nurse, Aiiku Association for Maternal and Child Health and Welfare, Tokyo, Japan

Dr Hiroko Ishimoto, Director, Tokushima Public Health Centre, Tokushima, Japan

Dr Bunpei Ishizuka, Professor and Chair, St Marianna University School of Medicine, Kanagawa, Japan

Mr Takashi Izutsu, Department of Mental Health, Graduate School of Medicine, University of Tokyo, Tokyo, Japan

Ms Junko Kamai, Editor, Digital Boutique, Inc., Tokyo, Japan

Ms Hiroe Kawashima, Chiba Branch, Japanese Midwives Association, Chiba, Japan

Dr Yuko Kawashima, Nippon Medical School, Tokyo, Japan

Ms Yumi Kim, Jiho Co. Ltd., Tokyo, Japan

Dr Hiromi Kinoshita, Chief, Department of Obstetrics and Gynaecology, Kochi Municipal Hospital, Kochi, Japan

Dr Mayumi Kiyota, Director, Kasuga Clinic, Kumamoto, Japan

Dr Yoko Kobamatsu, Chief, Obstetrics and Gynaecology, National Hakodate Hospital, Hokkaido, Japan

Dr Tomiko Kodaira, Director, Kodaira Medical Office, Chiba, Japan

Mrs Harumi Koga, Public Health Nurse, Matsudo Public Health Centre, Chiba, Japan

Dr Akemi Konishi, Director, Department of Preventive Medicine, Kobari General Hospital, Chiba, Japan

Ms Hanako Kubo, Acupuncture and Moxibustion Department, Osaka School of Medical Technology, Osaka, Japan

Dr Keiji Kumon, Director, National Hakodate Hospital, Hokkaido, Japan

Dr Michiko Kurosawa, Instructor, Juntendo University School of Medicine, Tokyo, Japan

Professor Margaret Lock, Professor of Anthropology, McGill University, Quebec, Canada

Ms Tomoko Maeda, Local Candidate Team Leader, Metabolic and Clinical Research, Pfizer Pharmaceuticals Inc., Tokyo, Japan

Dr Tsuyoshi Matsuba, Instructor, Department of Epidemiology and Environmental Health, Juntendo University School of Medicine, Tokyo, Japan

Mrs Kazuyo Matsui, Director of Nursing, Gifu Prefectural Hospital, Gifu, Japan

Mr Hiroshi Matsumori, Manager, Regulatory Affairs, Pfizer Pharmaceuticals Inc., Tokyo, Japan

Ms Yuriko Matsumura, Staff Writer, Lifestyle Section, Mainichi Newspapers, Tokyo, Japan

Ms Toshiko Matsunaga, Manager, Public Health Promotion Division, Health and Welfare Department, Chiba Prefecture, Chiba, Japan

Dr Yuichi Miwa, Director, Department of Health Screening, Tokyo Health Service Association, Tokyo, Japan

Dr Shunsaku Mizushima, Assistant Professor, International Research Centre for Medical Education, University of Tokyo, Tokyo, Japan

Dr Naomi Mochiduki, Foundation Kyoto Preventive Medical Centre, Kyoto, Japan

Professor Emi Mori, Chiba University School of Nursing, Chiba, Japan

Dr Shino Murakami, Hospital Director, Asahi General Hospital, Chiba, Japan

Dr Fuyoko Murasaki, Director, Josei Seijinbyo Clinic (Women's Adult Disease Clinic), Tokyo, Japan

Dr Atsuko Murashima, Chief, Division of Women's Health, National Centre for Child Health and Development, Tokyo, Japan

Dr Yoko Nagayama, Medical Supervisor, Health and Welfare Department, Chiba Prefecture, Chiba, Japan

Mr Yoshihiko Nakashima, Secretary, Health and Welfare Policy Section, Policy Coordination Bureau, Lifestyle and Social Service Department, Hyogo Prefecture, Hyogo, Japan

Mrs Etsuko Negishi, Research Assistant, Graduate School of Pharmaceutical Sciences, Chiba University, Chiba, Japan

Ms Yoshiko Niino, Specialist for MCH Guidance, Equal Employment, Children and Families Bureau, Maternal and Child Health Division, Ministry of Health, Labour and Welfare, Tokyo, Japan

Dr Keiichi Ogura, Director, Chiba Public Health Centre, Chiba, Japan

Dr Hiroya Okano, Tokyo Women's Clinic, Medical University, Tokyo, Japan

Dr Tatsuko Okura, Director, Okura Obstetrics and Gynaecological Clinic, Chiba, Japan

Mr Kazuto Ookubo, Chief, Medical Affairs Section, Yamanashi Prefectural Central Hospital, Yamanashi, Japan

Dr Dongmei Qiu, Department of Epidemiology and Environmental Health, Juntendo University School of Medicine, Tokyo, Japan

Dr Ichiro Sakuma, Assistant Professor, Department of Cardiovascular Medicine, Hokkaido University Graduate School of Medicine, Hokkaido, Japan

Dr Etsu Sakurai, Director, Sumitomo Clinic, Tokushima, Japan

Mrs Michiko Shibata, Vice-Director of Nursing, Gifu Prefectural Hospital, Gifu, Japan

Dr Minako Shibata, Third Department of Internal Medicine, Teikyo University School of Medicine, Chiba, Japan

Ms Tamayo Shitaba, Research Institute of Housing and Urban Problems, Tokyo, Japan

Dr Ellen Silveira, Research Fellow, Care of the Elderly Section, Imperial College of Science, Technology and Medicine, London, United Kingdom

Ms Maki Suehara, Asahi Elles Co. Ltd., Tokyo, Japan

Dr Joji Suzue, President, Tokushima Medical Association, Tokushima, Japan

Dr Hideko Suzuki, Kimitsu Chuo Hospital, Chiba, Japan

Mr Minoru Suzuki, Pharmaceutical Communications Manager, Pfizer Pharmaceuticals Inc., Tokyo, Japan

Dr Asako Takahashi, Assistant Director, Kochi Icho Hospital, Kochi, Japan

Dr Bin Takeda, Professor Emeritus, School Health Nursing Education, Chiba University, Chiba, Japan

Dr Chikari Takeo, Division of Endocrinology and Metabolism, Second Department of Internal Medicine, Chiba University School of Medicine, Chiba, Japan

Dr Kayo Takimura, Chief of Planning Office, Department of Administration, National Centre for Child Health and Development, Tokyo, Japan

Ms Yasuko Tamura, Clinical Instructor, College of Nursing Art and Science, Hyogo, Hyogo, Japan

Ms Hiroko Tashiro, Reporter, Time Magazine, Inc., Tokyo, Japan

Dr Jun Tashiro, Chief of Internal Medicine, Chiba Cardiovascular Centre, Chiba, Japan

Ms Tomoko Tobe, Vice-Manager, Policy Coordination Division, Policy and Planning Department, Chiba Prefecture, Chiba, Japan

Ms Keiko Tonosaki, Midwife, Yokohama City University Hospital, Kanagawa, Japan

Ms Masako Torishima, Instructor, College of Nursing Art and Science, Hyogo, Hyogo, Japan

Mr Atsuro Tsutsumi, Department of International Community Health, Graduate School of Medicine, University of Tokyo, Tokyo, Japan

Professor Koichi Ueno, Professor, Graduate School of Pharmaceutical Sciences, Chiba University, Chiba, Japan

Dr Akihiko Wakatsuki, Associate Professor, Department of Obstetrics and Gynaecology, Kochi Municipal Medical School, Kochi, Japan

Dr Sayaka Yagi, Chiba Cardiovascular Centre, Chiba, Japan

Mr Akira Yamada, Chief Examiner, Medical Division, Health and Welfare Department, Yamanashi Prefecture, Yamanashi, Japan

Dr Hiroshi Yamaguchi, General Director, Machida Municipal Hospital, Tokyo, Japan

Dr Ryoko Yanagibori, Associate Professor, Aichi Prefectural College of Nursing and Health, Aichi, Japan

Ms Yoshie Yanagihara, Research Assistant, School of Human Sciences, Waseda University, Saitama, Japan

Dr Hiromi Yoshida, Director, Daiei Hospital, Chiba, Japan

Dr Natsue Yuasa, Kujukuri Home Hospital, Chiba, Japan

Dr Motomi Zemba, Instructor in Internal Medicine, Juntendo Urayasu Hospital, Chiba, Japan

**Guests**

Ms Akiko Domoto, Governor, Chiba Prefecture, Japan

Ms Erika Ogawa, Director, Public Health Promotion Division, Health and Welfare Department, Chiba Prefecture, Japan

**Secretariat**

Dr Yuji Kawaguchi, Director

Ms Helen L'Orange, Consultant

Dr Catherine Sanga, Consultant

Dr Faten Ben Abdelaziz, Technical Officer

Ms Evelyn Abas, Administration

Ms Yoko Inoue, Secretary

Ms Naomi Kosaka, Secretary

Ms Maiko Suenaga, Secretary

Ms Kazumi Ueda, Public Information

# Annex 4: Group photo