

DIABETES

A MISSING LINK TO ACHIEVING
SEXUAL & REPRODUCTIVE HEALTH IN
THE ASIA-PACIFIC REGION





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Asian-Pacific Resource & Research Centre for Women (ARROW) & the World Diabetes Foundation (WDF)

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CONTENTS

PREFACE	5
ACKNOWLEDGEMENTS	7
ACRONYMS	8
DEFINITIONS	10
DIABETES AND WOMEN'S SRHR IN ASIA AND THE PACIFIC: Context, Scale and Burden of Disease	13
DIABETES AND MATERNAL HEALTH: Understanding Gestational Diabetes Mellitus	21
DIABETES AND SEXUALITY: A Missing Link	27
DIABETES AND SRHR: What Can We Do to Better the Lives of Women?	31
RESOURCES	35
LIST OF TABLES, BOXES AND FIGURES	
Table 1 : Top 10: Countries/Territories of Number of People with Diabetes (20-79 years, 2010, 2011, 2030)	15
Box 1 : Diabetes and Women: Facts and Figures	17
Box 2 : The Community Healthcare Worker: A Unique & Important Role in Reducing DM and GDM	25
Figure 1: Risk Factors and Co-morbid Conditions Associated with Diabetes	14
Figure 2: Diabetes & Pregnancy: Foetal & Maternal Risks	16
Figure 3: Foetal Programming and Nutritional Transition	24



PREFACE

Thirty-four years¹ have passed after the first global declaration that health indeed is a fundamental human right and yet, today, millions of people are deprived of and not guaranteed this basic right. Women constitute half of the world's population, but are disproportionately affected by poverty and ill-health. Women's sexual and reproductive health (SRH), which is critical to their health and wellbeing continues to be sidelined as an essential health and development intervention.

Despite the landmark international agreements of Cairo (1994) and Beijing (1995), which recognised the right to universal access to SRH, governments around the world continue to marginalise and adversely politicise women's SRH. Within the MDGs it is becoming increasingly clear that the MDG5 SRH targets will not be met by 2015; and that the Asia-Pacific region continues to account for the highest numbers of preventable maternal deaths, outside of Sub-Saharan Africa.

Other SRH issues such as maternal morbidities, which affect a quarter of the women in the developing world, continue to be uncouned, underreported, and unaddressed. Action on adolescent fertility and sexuality and unsafe abortion lags behind as governments refuse to take on issues that are considered politically unsafe with their electorates while women and girls continue to suffer death and disability.

In recent years, it has become very evident that noncommunicable diseases adversely affect large numbers of women. Gender differentials in access to healthcare, screening services and treatment make women particularly vulnerable to specific noncommunicable diseases. Women are said to account for half the people living with diabetes, and in some countries they have preponderance over men. With changes in lifestyle and the increasing prevalence of obesity, diabetes is affecting younger women of reproductive age and increasing the risk of pregnancy complications. Diabetes has an impact on the sexual and reproductive health and lives of men and women, but these interlinks are very seldom explored and talked about. There is evidence that diabetes has its inception in the womb and yet this evidence has not caught the imagination and attention of SRHR practitioners, researchers, policy makers, and implementers.

ARROW has always been keen on identifying critical issues that intersect and impact women's sexual and reproductive health and rights. Diabetes in pregnancy is a neglected issue that needs urgent global attention not only for its negative maternal and perinatal consequences, but for the potential life long disabilities it causes for the woman and child. Recognising both the challenges posed by diabetes and the opportunities for prevention offered with timely identification, treatment, and control during pregnancy, ARROW agreed to partner with the World Diabetes Foundation, based in Denmark, to raise awareness and understanding of the issues. At the 6th Asia Pacific Conference on Reproductive and Sexual Health and Rights (APCRSHR),² ARROW and WDF co-organised a satellite session that highlighted the "missing links" between diabetes and SRHR. The conference offered an ideal opportunity for introducing the issue of NCDs, diabetes and SRHR – a topic never discussed prior to this session – to a wide range of SRHR practitioners, researchers, advocates, and policy makers.

The session brought together a panel of eminent speakers to deliberate on the context, scale, and burden of diabetes in the Asia-Pacific region with specific focus on women's SRHR, the linkage between diabetes and maternal and child health, and diabetes and sexuality in men and women.

This publication brings together the papers presented at the satellite session. We hope this publication will foster a broader understanding of the interlinkage between diabetes and women's health especially women's sexual and reproductive health, and that it will support regional and global advocacy towards reducing maternal and perinatal mortality and morbidity, and improving women's sexual and reproductive health and rights in the Asia-Pacific region. We also hope that the recommendations to policy makers, programme implementers, medical practitioners, donors, and other stakeholders will be heeded and action be taken on the specific recommendations.

The United Nations General Assembly resolution on diabetes passed in 2006, and the more recent UN high level meetings on NCDs are positive actions towards addressing this issue. This is an opportune moment to recognise and advocate that effective screening for the prevention and control of diabetes be put in place in order to safeguard women's health and women's sexual and reproductive health.

I would like to express my sincere gratitude to all the panel members who actively participated in the satellite session and contributed papers that are compiled in this volume. I am also grateful to the World Diabetes Foundation for giving us this opportunity to take on an important and urgent issue that is neglected, and to look at the intersections of diabetes with women's sexual and reproductive health.

Sivananthi Thanenthiran
Executive Director
Asian-Pacific Resource & Research Centre for Women (ARROW)

ENDNOTES

- 1 WHO, Declaration of Alma-Ata, International Conference on Primary Health Care, Alma-Ata, USSR, 6-12 September 1978.
- 2 The 6th APCRSRHR was held from 20-22 October 2011 in Yogyakarta, Indonesia. The satellite session was held on the 21 October, from 10.30am-12.15pm.

ACKNOWLEDGEMENTS

This publication is an outcome of the inspiration, initiatives, guidance and support of several individuals and organisations, and ARROW is truly grateful to each one of them. We extend our sincere gratitude to the World Diabetes Foundation for their generous funding and for co-hosting the symposium *“Diabetes – A Missing Link to Achieving Sexual and Reproductive Health in the Asia-Pacific Region”* at the 2011 Asia Pacific Conference on Reproductive and Sexual Health and Rights (6th APCRSR), in Jogjakarta, Indonesia, the papers from which are compiled in this volume.

Our deep appreciation to Dr. Narimah Awini for chairing the satellite session, contributing the concluding chapter of this book, as well as for serving as one of the reviewers for the three papers in this publication. We are especially thankful to all the symposium presenters and paper contributors: Dr. Anil Kapur, Dr. Jessica Ona-Cruz, and Dr. Hoang Tu Anh for their courage in taking on a relatively new topic in the area of sexual and reproductive health and rights, and for committing time and energy to the symposium as well as this publication. We are thankful to all the reviewers: Rashidah Abdullah, Dr. Narimah Awini, Dr. Anil Kapur, and Sivananthi Thanenthiran for their critical readings and insightful comments that contributed to the sharpening of the papers in this compilation. We are indebted to Dr. Saramma Thomas Mathai, the Regional Team Coordinator and Maternal Health Advisor, of the United Nations Population Fund, Asia Pacific Regional Office, Junice Melgar, Likhaan, and Dr. Anil Kapur and Hanne Strandgaard of the World Diabetes Foundation (WDF) for their timely help in identifying and connecting resource persons for the symposium.

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ACRONYMS

ADA	American Diabetes Association
AGA	Appropriate for Gestational Age
AIDS	Acquired Immune Deficiency Syndrome
ARROW	Asian-Pacific Resource & Research Centre for Women
ARV	Antiretroviral (Drugs)
BMI	Body Mass Index
CHW	Community Healthcare Workers
DALY	Disability Adjusted Life Years
FPG	Fasting Plasma Glucose Test
FWCW	United Nations Fourth World Conference on Women
GDM	Gestational Diabetes Mellitus
HAPO	Hyperglycemia and Adverse Pregnancy Outcomes
HDL	High-density Lipoprotein
HIV	Human Immunodeficiency Virus
HSSD	Hypoactive Sexual Desire Disorder
IADPSG	International Association of Diabetes in Pregnancy Study Groups
ICPD	International Conference on Population and Development
IDF	International Diabetes Federation
IGF	Insulin-like Growth Factor
IGT	Impaired Glucose Tolerance
IJGO	International Journal of Gynecology and Obstetrics
IRDS	Infant Respiratory Distress Syndrome
MCH	Maternal and Child Health
MDGs	Millennium Development Goals
MMR	Maternal Mortality Rate
MMR	Maternal Mortality Ratio
MoH	Ministry of Health
NCDs	Noncommunicable Diseases
OGTT	Oral Glucose Tolerance Test
PHC	Primary Health Care
PIC	Pregnancy Induced Hypertension

PoA	Programme of Action
PPH	Post-partum Haemorrhage
RCH	Reproductive and Child Health
RR	Relative Risk
SAD	Sexual Aversion Disorder
SGA	Small for Gestational Age
SRHR	Sexual and Reproductive Health and Rights
WDF	World Diabetes Foundation
WHO	World Health Organization

DEFINITIONS

DIABETES MELLITUS

Diabetes mellitus or simply referred to as diabetes is a chronic condition that occurs when the body cannot produce enough or effectively use insulin.¹ Insulin is a hormone produced by the pancreas that allows glucose from food to enter the body's cells where it is converted into energy needed by muscles and tissues to function. As a result, a person with diabetes does not absorb glucose properly, and glucose stays circulating in the blood (hyperglycaemia²) damaging tissues over time. This damage leads to life-threatening health complications. There are three main types of diabetes: type 1 diabetes, type 2 diabetes, and gestational diabetes mellitus (GDM).

Type 1 diabetes, also called insulin-dependent, immune-mediated or juvenile-onset diabetes, is a severe form of diabetes mellitus, usually of abrupt onset during the first two decades of life but can develop at any age. It is caused by an auto-immune reaction where the body's defence system attacks the insulin-producing cells. People with type 1 diabetes produce very little or no insulin. They will need injections of insulin every day in order to control the levels of glucose in their blood and can die without it.³

Type 2 is the most common type of diabetes and accounts for at least 90% of all cases of diabetes. It is sometimes called non-insulin dependent diabetes or adult-onset diabetes, and is characterised by insulin resistance and relative insulin deficiency, either of which may be present at the time that diabetes becomes clinically manifest. The diagnosis of type 2 diabetes usually occurs after the age of 40 but can occur earlier, especially in populations with high diabetes prevalence. Type 2 diabetes can remain undetected for many years and the diagnosis is often made from associated complications or incidentally through an abnormal blood or urine glucose test. It is often, but not always, associated with obesity, which itself can cause insulin resistance and lead to elevated blood glucose levels.³

Gestational diabetes⁴ is a transient form of diabetes, being first recognised during pregnancy. Pregnant women who meet the WHO criteria for diabetes mellitus or Impaired Glucose Tolerance are classified as having gestational diabetes. There are different definitions and means for testing and diagnosing gestational diabetes.⁵ According to World Health Organization (WHO) standards, gestational diabetes is diagnosed by means of a standard OGTT (Oral Glucose Tolerance Test) conducted

at 24-28 weeks of gestation after an overnight fast. If the fasting venous plasma sample is ≥ 126 mg/dL and/or if at two hours, following a glucose drink containing 75 g glucose, the venous plasma glucose level is ≥ 140 mg/dL the pregnant woman is diagnosed with gestational diabetes. The test is simple, cheap and requires easily available equipment. The American Diabetes Association (ADA) revised its criteria for GDM in 2010 and recommended the following cut off value, which is a 100 g glucose load FPG 95 mg/dl (5.3 mmol/l), 1-h 180 mg/dl (10.0 mmol/l), 2-h 155 mg/dl (8.6 mmol/l), 3-h 140 mg/dl (7.8 mmol/l).⁶ The International Association of Diabetes in Pregnancy Study Groups (IADPSG) has recommended the following values FPG >92 mg/dl (5.1 mmol/l), 1-h: >180 mg/dl (10.0 mmol/l), 2-h: >153 mg/dl (8.5 mmol/l) for diagnosis of GDM using a 75 g glucose load.⁷ Increasingly the IADPSG Criteria is being accepted to define GDM. The WHO is currently in the process of revising its criteria for GDM.

SCREENING WOMEN FOR DIABETES DURING AND AFTER PREGNANCY

Ideally, every woman should be screened for diabetes when they first present themselves with pregnancy to rule out pre-existing but hitherto unknown diabetes. If negative, they should be screened again between 24 to 28 weeks of pregnancy to rule out GDM. Should they be positive for GDM they should be monitored closely to ensure that their diabetes is responding to treatment and their blood sugar levels are under control. The frequency of checking will depend on the level of blood sugar and type of treatment they undergo to ensure good control. After delivery, women should be checked between two to six weeks to ensure they do not have type 2 diabetes, which first became manifest during pregnancy. If they test positive they must be treated for type 2 diabetes and checked as per the norms. If the results are negative at two to six weeks, the diagnosis of GDM is confirmed and, as these women are at high risk they should be screened every year or two years as part of routine check-up. They must also be checked if they become pregnant the next time.⁸

FOETAL PROGRAMMING

Foetal programming⁹ is a permanent change in structure or physiological function in the foetus or embryo occurring while in the womb during the period of organ development and growth as a result of a defined stimulus. Source: WDF & Global Alliance for Women's Health (2008). Conclusions and follow-up action. Diabetes, Women and Development meeting summary, expert recommendations for policy action, conclusions, and follow-up actions. In *International Journal of Gynecology and Obstetrics*, 104

(2009) S46–S50.

IMPAIRED GLUCOSE TOLERANCE

Impaired Glucose Tolerance is a condition where the blood glucose levels are higher than normal, but below the level of a person with diabetes. It is said to be a combination of impaired secretion of insulin and reduced insulin sensitivity, i.e. resistance to insulin. Although a reversible condition, people with IGT are more susceptible to developing type 2 diabetes and hence it is also called “pre-diabetes.”¹⁰

REPRODUCTIVE HEALTH

Reproductive health is “a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity.” It “addresses the reproductive processes, functions and system at all stages of life.” It “implies that people are able to have a responsible, satisfying and safe sex life and that they have the capability to reproduce and the freedom to decide if, when, and how often to do so. Implicit in this are the rights of men and women [as well as gender non-conforming people] to be informed of and to have access to safe, effective, affordable, and acceptable methods of fertility regulation of their choice, and the right of access to appropriate healthcare services that will enable women to go safely through pregnancy and childbirth and provide couples with the best chance of having a healthy infant. Adapted from, “Reproductive Health.”¹¹

REPRODUCTIVE RIGHTS

Reproductive rights “recognise that the sexual and reproductive health of women and men [as well as gender non-conforming people] requires more than scientific knowledge or biomedical intervention.” Rather, they require “recognition and respect for the inherent dignity of the individual.” They “refer to the composite of human rights that protect against the causes of ill health and promote sexual and reproductive wellbeing.” They “embrace certain human rights that are already recognised in national laws, international human rights documents, and other consensus documents. These rights rest on the recognition of the basic right of all couples and individuals to decide freely and responsibly the number, spacing, and timing of their children and to have the information and means to do so, and the right to attain the highest standard of sexual and reproductive health. It also includes their right to make decisions concerning reproduction free of discrimination, coercion, and violence, as expressed in human rights documents.” Reproductive rights include the right to safe, legal, and accessible abortion services.¹²

SEXUAL HEALTH

Sexual health is a “state of physical, emotional, mental

and social wellbeing in relation to sexuality; it is not merely the absence of disease, dysfunction or infirmity. Sexual health requires a positive and respectful approach to sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences, free of coercion, discrimination and violence.” The purpose of sexual health care should be “the enhancement of life and personal relations, and not merely counselling and care related to reproduction and sexually transmitted diseases.”¹⁴ “For sexual health to be attained and maintained, the sexual rights of all persons must be respected, protected and fulfilled.”¹³

SEXUAL RIGHTS

Sexual rights “embrace human rights that are already recognised in national laws, international human rights documents, and other consensus documents. They include the right of all persons, free of coercion, discrimination, and violence, to: the highest attainable standard of health in relation to sexuality, including access to sexual and reproductive health care services; seek, receive, and impart information related to sexuality; sexuality education; respect for bodily integrity; choose their partner; decide to be sexually active or not; consensual sexual relations; consensual marriage; decide whether or not, and when to have children; and pursue a satisfying, safe, and pleasurable sexual life.”¹⁴ Sexual rights also include the “right to personhood [the right to make one’s own choices], equality [between and among men, women, and transgender people], and respect for diversity [in the context of culture, provided the first three principles are not violated].”¹⁵ Moreover, “a human rights approach to sexuality and sexual policy implies the principle of indivisibility—meaning that sexual rights are inextricable from economic, social, cultural, and political rights. Freedom to express one’s sexual or gender orientation or to be who one is as a sexual person, to experience erotic justice, is interdependent with a whole series of other rights, including healthcare, decent housing, food security, freedom from violence and intimidation, and to be in public space without shame.”¹⁶

Compiled by Ambika Varma, Programme Officer, ARROW.

ENDNOTES

- 1 Harris M. & Zimmet P. (1997). Classification of diabetes mellitus and other categories of glucose intolerance. In Alberti, K. & Zimmet, P. & Defronzo, R. (Eds.). *International Textbook of Diabetes Mellitus*. 2nd ed. Chichester: John Wiley and Sons Ltd. 9-23. www.idf.org/diabetesatlas/5e/what-is-diabetes
- 2 Hyperglycaemia is when the sugar content in the blood is higher than normal levels.
- 3 International Diabetes Federation. www.idf.org/types-diabetes

- 4 Extracted and adapted from the World Diabetes Foundation website at www.worlddiabetesfoundation.org/composite-2671.htm
- 5 WHO. (1999). *Definition, diagnosis and classification of diabetes mellitus and its complications. Report of a WHO consultation part 1: Diagnosis and classification of diabetes mellitus*. Geneva: Department of Noncommunicable Disease Surveillance, World Health Organization Geneva.
- 6 American Diabetes Association. (2010). Standards of medical care in diabetes. *Diabetes Care*, 33(Suppl 1), S11-S61.
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- 8 Dr. Anil Kapur, via email communication.
- 9 Hod, M., Wolfson, E. & Lefebvre, P. (2009). Diabetes, women, and development. Meeting summary, expert recommendations for policy action, conclusions, and follow-up actions. *International Journal of Gynecology & Obstetrics*, 104, S46–S50.
- 10 International Diabetes Federation www.idf.org/fact-sheets/impaired-glucose-tolerance
- 11 Source: AFC 15(2&3) (2009), pp.19: WHO www.wpro.who.int/health_topics/reproductive_health/
- 12 Source: AFC 15(2&3) (2009), pp.19: ICPD PoA, para 7.3
- 13 Source: AFC 15(2&3) (2009), pp.19: ICPD PoA, para 7.2
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- 16 Source: AFC 15(2&3) (2009), pp.19: Petchesky, R. (2006). Introduction: Sexual rights policies across countri(es) and cultures: Conceptual frameworks and minefields." In Parker, R., Petchesky, R. & Sember, R. *SexPolitics: Reports from the Frontlines*. Sexuality Policy Watch. www.sexpolitics.org/frontlines/book/pdf/sexpolitics.pdf



DIABETES AND WOMEN'S SRHR
IN ASIA AND THE PACIFIC:
CONTEXT, SCALE AND BURDEN OF
DISEASE

The rising burden of diabetes is affecting all people in all societies: children, men, women, rich as well as poor. According to the International Diabetes Federation (IDF) Atlas 4th edition, there are 285 million people worldwide living with diabetes, 143 million of whom are women. By 2030, the total number of adults with diabetes is likely to reach 438 million, of whom 222 million will be women – a rise of 56%. This means in 2030 there will be six million more women with diabetes than men as the rate of growth of diabetes is greater amongst women.^{1,2} In addition, there are 344 million people (a slight preponderance of women - 179 million women compared to 165 million men) with a condition called pre-diabetes or impaired glucose tolerance (IGT) which makes them highly vulnerable to future diabetes. The numbers are much higher as shown in the IDF Diabetes Atlas 5th edition. As per the new estimates in 2011, there are 366 million people (184 million women) with diabetes, an increase of almost 80 million more than in 2010.

The Asia-Pacific region seems to be at the heart of this rising trend for diabetes and related chronic diseases and accounts for about half the global burden of diabetes. China, India, Indonesia, Pakistan and Bangladesh figure amongst the top ten countries with the highest number of people with diabetes.¹ In many of these countries, particularly India and China, one out of every eight to ten adults living in urban areas has diabetes. Similar numbers have pre-diabetes. The rates in rural areas are lower but increasing rapidly. Chronic noncommunicable diseases (NCDs) including diabetes currently account for 35 million deaths each year – or 60% of all deaths worldwide – of which 80% occur prematurely in low- and middle-income countries.³

Similarly, chronic diseases account for the vast majority of DALYs⁴ in the low- and middle-income countries as well.⁵ Globally, the trend is moving towards increasing morbidity and mortality from chronic diseases.

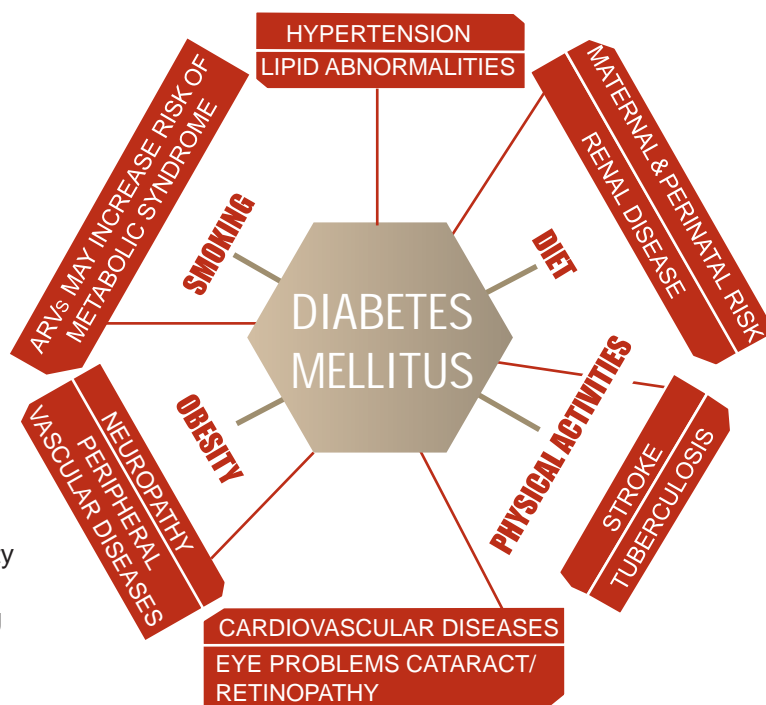
DIABETES IMPACTS WOMEN DISPROPORTIONATELY

In the Asia-Pacific region as elsewhere in the world female life expectancy has increased substantially over the last five decades, mainly as a consequence of improved maternal health and control of infectious diseases. However, the rising trend of NCDs such as diabetes may stem further growth in longevity and quality of life. Every minute, 4 women die from diabetes and a substantial number of these deaths occur prematurely particularly in the developing world.

In 2010, over 2.1 million women died worldwide as a result of diabetes,² compared to 1.8 million men. In Southeast Asia (WHO classification of countries include countries in South Asia), mortality due to diabetes accounted for almost 25% of all deaths in women in the 50-59 age group while it was responsible for 15% of deaths in men in the same age group above.²

Beyond this, diabetes is also the fundamental problem present in many deaths recorded as caused by cardiovascular diseases or renal failure.^{6,7} In addition, deaths attributable to diabetes in women may be actually higher because gestational diabetes mellitus (GDM) – a transitory form of diabetes during pregnancy – which increases risk of poor pregnancy outcomes including maternal deaths, is often not diagnosed as women are not routinely screened for it. There are several reasons for it – diabetes and NCDs have no priority on the public health agenda. Also the perception is that diabetes does not affect the poor and that diabetes afflicts only the elderly, as well as a misconception that GDM is not a serious problem. Furthermore, there is a lack of knowledge and understanding about the links between diabetes in

FIGURE 1. RISK FACTORS & CO-MORBID CONDITIONS ASSOCIATED WITH DIABETES



pregnancy and poor pregnancy outcomes, as well as higher risk of future diabetes for mother and children.

The World Health Organization's (WHO) report on women and health indicates that high blood pressure and high blood glucose are two leading risk factors for death from chronic conditions in women above 20 years of age.⁸ Despite the gross under reporting of diabetes as a cause of death it is still among the ten leading causes of death in women in all but the low-income countries where it is a leading cause of death in women above 60 years only.⁸

Women with diabetes have a higher risk of developing major medical complications. The risk of heart attack, stroke, kidney failure, blindness or losing a limb through amputation is several times higher than those amongst men.

Table 1. Top 10: Countries/territories of number of people with diabetes (20-79 years, 2010, 2011, 2030)

Country/ Territory	2010 (Millions)	Country/ Territory	2011 (Millions)	Country/ Territory	2030 (Millions)
INDIA	50.8	CHINA	90.0	CHINA	129.7
CHINA	43.2	INDIA	61.3	INDIA	101.2
USA	26.8	USA	23.7	USA	29.6
RUSSIAN FEDERATION	9.6	RUSSIAN FEDERATION	12.6	BRAZIL	19.6
BRAZIL	7.6	BRAZIL	12.4	BANGLADESH	16.8
GERMANY	7.5	JAPAN	10.7	MEXICO	16.4
PAKISTAN	7.1	MEXICO	10.3	RUSSIAN FEDERATION	14.1
JAPAN	7.1	BANGLADESH	8.4	EGYPT	12.4
INDONESIA	7.0	EGYPT	7.3	INDONESIA	11.8
MEXICO	6.8	INDONESIA	7.3	PAKISTAN	11.4

Source: International Diabetes Federation. IDF Diabetes Atlas, 4th and 5th edn. Brussels, Belgium: International Diabetes Federation, 2009, 2011. www.idf.org/diabetesatlas

Women with diabetes are 50% more likely to die of heart disease including congestive heart failure. Also, they are 74% more likely to die from renal disease and have a 10% higher risk of severe vision loss compared to men. Pre-menopausal women with diabetes lose the natural protection against heart disease that non-diabetic women have.⁹ They have higher levels of triglycerides and lower levels of beneficial HDL cholesterol than men with diabetes,¹⁰ and also tend to have higher blood pressure than their male counterparts,¹¹ thereby contributing to the higher risk in women with diabetes for heart attacks or strokes.

Women, with type 1 diabetes, are twice as likely as men to suffer nerve (neuropathy) and eye (retinopathy) problems.¹² Cyclical hormonal changes make diabetes control more difficult in women and the risk of diabetic ketoacidosis is 50% higher among women than men.¹³ Women are also consistently more likely to develop depression.¹⁴

Women in most parts of the world tend to receive less adequate care than men, especially for complications. Diabetes care for women is very variable; access is poor in low- and middle-income countries, and can also be inadequate in high-income countries compared to men with diabetes who tend to receive better and more aggressive cardiovascular and hypertensive treatment.^{11, 15, 16}

DIABETES DURING PREGNANCY

While quickly becoming a major public health problem in the Asia-Pacific region, diabetes also has particular relevance to the issue of women's sexual and reproductive health (SRH). Before the insulin era, women with diabetes were advised not to marry and not to get pregnant. If they did, they could not expect to deliver live babies provided they themselves survived the pregnancy. This has changed dramatically in most parts of the world. However, for many women in the developing world with

type 1 diabetes who have poor access to care, pregnancy still poses a serious risk to the mother as well as the foetus, involving high rates of maternal morbidity and mortality and poor pregnancy outcomes as described in a later article.

Diabetic pregnancy brings its own short- and long-term risks for both mother and the baby. Worldwide, one in ten pregnancies may be associated with diabetes, 90% of which involve GDM. In high-risk groups, up to 30% of pregnancies may involve diabetes.^{17, 18} Over the last 20 years, more young people have been developing type 2 diabetes especially in low-income countries. As a consequence, in the years to come, more and more women may enter pregnancy with pre-existing diabetes.¹⁹ In the two most populous countries China and India, rates of GDM are 12.2% and 14.3% respectively.^{20, 21} The age adjusted prevalence of GDM in women in USA shows that the rates are higher for women with Asian and Pacific Island origin, but more so (almost three fold compared to non-Hispanic whites) for migrant women born in the country of their origin.²² Thus women of Asian and Pacific ethnicity have some of the highest rates of GDM globally.

In 2010, there were an estimated 22 million women with diabetes in the reproductive age group of 20 to 39 years; an additional 54 million in this age group had IGT or pre-diabetes with potential to develop gestational diabetes if they become pregnant.¹ Thus over 76 million women are at risk of their pregnancy being complicated with pregestational (existing) diabetes or gestational diabetes (diabetes occurring or first recognised during pregnancy). Women with diabetes need careful management during pregnancy, whether their diabetes is pre-existing type 1 or type 2, or GDM. Without special care, they are at risk of serious complications. In a very large study it was shown that the negative consequences on the foetus and the mother increase linearly with increasing maternal blood glucose.²³

Diabetes in pregnancy can lead to serious complications for both the mother and child, but these can be controlled effectively through early diagnosis, careful dietary management, exercise and, in some cases, medication. It is now recognised that a proportion of women diagnosed during pregnancy may have had diabetes before pregnancy (type 1 or type 2). Diabetes present before pregnancy is more serious than GDM, both for the mother and the foetus, as high blood-glucose levels are present from the beginning of the pregnancy when the foetal organs are being formed and the placenta is developing. Because of this, women with pregestational diabetes show higher rates of foetal malformation.^{24, 25, 26}

Good blood-glucose control before conception and throughout pregnancy reduces these risks substantially.^{27, 28} Major problems related to high blood glucose during pregnancy are shown in figure 2. Many women with past history of spontaneous abortions often get diagnosed with GDM in subsequent pregnancies. While several risk factors have been described to clinically identify women with GDM, in practice they fail to correctly identify more than half the women with GDM.^{18, 29} Therefore, in women with Asia-Pacific descent, a policy of universal screening for GDM needs to be implemented.

Women diagnosed with GDM are at high risk of developing type 2 diabetes within a few years compared to women without GDM. A recent meta-analysis shows that women with gestational diabetes had an increased risk of developing type 2 diabetes (relative risk³⁰ - RR 7.43, 95% CI 4.79–11.51). Women within 5 years of a pregnancy complicated by gestational diabetes had a relative risk of 4.69 of developing overt type 2 diabetes which more than doubled to 9.34 in those who were examined more than 5 years post-partum.³¹ The risk can be considerably reduced or the onset of diabetes considerably delayed by taking appropriate preventive steps in terms of post-partum weight loss and a healthy lifestyle.³²

Children of mothers with uncontrolled diabetes – either pre-existing or originating during pregnancy – are four to eight times more likely to develop diabetes themselves in later life compared to their siblings born to the same parents in a non-GDM pregnancy.^{33, 34} This shows that the environment in the uterine life contributes significantly to the higher risk than can be explained by genetic inheritance alone. A recent study suggests that a significant proportion (47.2%) of diabetes and obesity in youth can be attributed to maternal GDM and obesity.³⁵ Another study suggests that GDM may be responsible for 19 – 30% of all type 2 diabetes seen among Saskatchewan First Nations people in Canada.³⁶

A WHO systematic review of causes of maternal death published in the Lancet in 2006 states that haemorrhage, hypertensive disorders, obstructed labour, and infection/sepsis are among the leading global causes of maternal mortality.³⁷ High blood pressure and GDM are linked directly or indirectly to all of the above. The report of the UN Secretary General to the General Assembly before the UN high level meeting on NCDs clearly states the

need to create links between NCDs and maternal and child health programmes. The report also raises concern that the rising prevalence of high blood pressure and GDM is increasing the adverse outcomes of pregnancy and maternal health.³⁸

FIGURE 2. DIABETES & PREGNANCY

FOETAL RISKS

- Spontaneous abortion, intrauterine death & still birth
- Lethal or handicapping congenital malformation
- Shoulder dystocia & birth injuries
- Neonatal hypoglycemia & IRDS

MATERNAL RISKS

- Hydroamnios, preclampsia, PIH
- Progression of retinopathy
- Obstructed labour, assisted delivery & C-section
- Infections

Maternal hyperglycemia is associated with a high risk of maternal & perinatal morbidity & mortality, & poor pregnancy outcomes. Treatment of GDM significantly improves pregnancy outcomes.

Therefore addressing prevention, screening and care of GDM is complementary to the agenda of lowering maternal mortality and morbidity and is not an attempt to take the focus away from it as some activists within the maternal health advocacy groups mistakenly believe.

Mounting evidence shows that prenatal and early-life development influence the risks of NCDs in later life,^{39, 40, 41} and might be especially relevant to resource poor countries.^{41, 42, 43, 44} Mother's diet, body composition, and health determine foetal environment and are shown to affect risk factors. Improvements in access to care in many low- and middle-income countries have led to improved survival for even the "at risk" small for gestational age (SGA) babies born to under-nourished mothers in rural settings. These babies programmed to survive with less, continue to be malnourished and stunted during childhood, but remain at relatively low risk for NCDs in adult life as long as they have a subsistent lifestyle. With even minor changes towards improved living conditions and thus changes in the environment for which they were programmed, as a consequence of economic development or migration to towns or cities, these individuals manifest the risk of diabetes and other NCDs at much lower body weight and body mass index (BMI) and central adiposity threshold.⁴⁵ Transition in lifestyle in this population seems to produce rapid adverse changes favouring development of diabetes and cardio-metabolic disorders.⁴⁶ In young women, adverse changes may present during pregnancy, resulting in gestational diabetes and/or pregnancy induced hypertension. Seshiah et al.⁴⁷ reported prevalence rates of 8–10% for GDM among women of low socioeconomic status who had a pre-pregnancy BMI of less than 19, and significantly higher prevalence rates at higher BMIs and in urban environments.

BOX 1. DIABETES & WOMEN: FACTS & FIGURES

- The total world population as of 2011 is 7.0 billion and is estimated to become 8.3 billion by 2030
- The adult population (20-79 years) is 4.4 billion (2011) and is estimated to be 5.6 by 2030
- There are 366 million people with diabetes as of 2011 and it is estimated to rise to 552 by the year 2030
- 80% of people with diabetes live in low- and middle-income countries
- NCDs account for 60% of deaths worldwide, & diabetes is the 7th leading cause of death in women globally
- 184 million (2011) women live with diabetes and an estimated 179 million (2010) women have IGT
- Two out of every five women with diabetes are of reproductive age, and an estimated 4 women die every minute from diabetes
- Globally, one in ten pregnancies maybe associated with diabetes, 90% of which involve GDM
- Maternal mortality in pregnant women with type 1 diabetes is 5–20 times higher than that of women without diabetes in some countries
- Approximately half of the women with GDM, develop type 2 diabetes within five to ten years of delivery
- Pre-menopausal women with diabetes lose the natural protection against heart disease than non-diabetic women
- Women with diabetes are 50% more likely to die of heart disease including congestive heart failure, 74% more from renal disease, and have 10% higher risk of sever vision loss compared to men
- Women with type 1 diabetes are twice as likely as men to suffer nerve and eye problems
- Cyclical hormonal changes make diabetes control more difficult in women

Source: International Diabetes Federation. IDF Diabetes Atlas, 4th and 5th edn. Brussels, Belgium: International Diabetes Federation, 2010-11. www.idf.org/diabetesatlas; WHO, 2009; & Kapur A. 2012

While maternal undernutrition and its links to future NCDs in children have been more widely studied, similar mechanisms may apply to other conditions, such as maternal malaria and HIV/AIDS that also result in low birth weight and SGA babies. GDM in turn increases the risk of future diabetes and NCDs in the offspring thus creating a vicious cycle in which diabetes begets more diabetes.

FOCUS ON WOMEN'S HEALTH: KEY TO REDUCING DIABETES

Women with diabetes have a very special influence on the health of the next generation. In addition to the genetic susceptibility and the direct biological influence during pregnancy (through the uterine environment) and by breast-feeding in the early part of life, women also influence the next generation by feeding and caring for their children, thereby imprinting lifelong behaviour and shaping likes and dislikes - encouraging a healthy lifestyle, or otherwise. However women themselves suffer considerable discrimination. For example, 60% of the world's poor are women,⁴⁸ and more than 580 million women are illiterate (2/3rds of illiterate adults worldwide).⁴⁹ More than 70 million girls do not attend school. Women are less likely to be paid for their work, and are considered less valuable than men. In traditional societies, dependence on men to go to the health facility means that women get delayed access to care and poor follow-up care.⁷ Twice as many women as men suffer from malnutrition, and are less able to make food choice.^{50, 51} Outdoor physical activity for women is difficult in countries with conservative norms and these have consequences for the treatment of diabetes. Women with diabetes face additional problems: they are discriminated against at work, and suffer from higher rates of job loss;¹⁸ they have higher rates of divorce and separation than other women.^{18, 52} Girls with diabetes have difficulty in finding husbands; families may withdraw support and refuse access to education and they may be forced to keep their diabetes status a secret, compounding

diabetes-related guilt and depression, and sometimes may experience fatal consequences as a result of stopping insulin.^{53, 54}

The concept of foetal programming and its consequences is paradigm changing. It highlights that pregnancy offers a window of opportunity to provide maternal care services, not only to reduce the traditionally known maternal and perinatal morbidity and mortality indicators, but also to have great potential for intergenerational prevention of several chronic diseases, such as diabetes, arterial hypertension, cardiovascular disease, and stroke. Thus, with one high-quality intervention related to maternal and child health services, it is now possible to achieve several objectives with far reaching health and economic benefits.¹⁸

CONCLUSIONS

The growing burden of obesity, diabetes and hypertension affecting people at earlier ages means that these conditions pose major problems for sexual and reproductive health. People with diabetes have lower fertility; diabetes causes impotence and erectile dysfunction in men and vaginal dryness and pain during intercourse in women. Men and women with diabetes have high rates of genital infections. Women with diabetes have difficulty in conceiving, have higher rates of spontaneous abortions, and generally poor pregnancy outcomes. Because of gender based bias women have poor access to care, or less than optimal care, and consequently have worse outcomes in terms of diabetes control, rate of complications and quality of life. It also costs them more for routine ambulatory care. Studies in India have shown that ambulatory care in women consistently costs more than in men.^{55, 56}

However, costs per episode of hospitalisation were lower for women. This may be because women were hospitalised for a shorter duration, or in cheaper facilities,

or simply because hospitalisation requiring advanced care such as for heart problems did not occur for women. Many socio-economic factors such as lower education, lack of independent financial resources, and dependency on males etc. contribute to the poor uptake of diabetes treatment and care in women.

However, while advocating the cause for increasing attention to GDM one needs to be careful not to create a platform for women to be blamed for adverse effects on their children and create another agenda for stigmatisation of women in some cultures.

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DIABETES AND MATERNAL HEALTH: UNDERSTANDING GESTATIONAL DIABETES MELLITUS

"The first 1,000 days of life, which include the nine months in the womb, are a blueprint for our health for the rest of our lives." - Prof. Jean Claude Mbanya, President, IDF

The past decades have seen a sustained increase in the prevalence of diabetes. Contributing largely to these numbers are women in the reproductive age group who develop diabetes during pregnancy. The worldwide prevalence of diabetes in pregnancy ranges from 1-28%, as is seen from results of a recent survey conducted at single- and multi-sites in 173 countries, in addition to using national prevalence assessments in these countries.¹ Diabetes is one of the most common medical complications seen in pregnant women.² In pregnancy, diabetes may manifest due to conditions of hyperglycaemia prior to conception known as pregestational diabetes, or it may be detected for the first time during pregnancy where it is called gestational diabetes mellitus (GDM).²

RISK FACTORS FOR DEVELOPING DIABETES MELLITUS

A number of factors contribute to the risk of developing gestational diabetes. These include, among others, obesity, a sedentary lifestyle, an unhealthy diet, smoking, in utero undernutrition, genetics (e.g. belonging to or of Asian and Pacific ethnicity), chronic infections (TB, hepatitis B), environmental exposure to irritants, family history, pre-diabetes or impaired glucose tolerance (IGT), sugar in the urine, and the pregnant woman being over 35 years in age. It is, however, worthwhile to note that many women develop the disease even in the absence of these known risk factors.

MATERNAL EFFECTS OF DIABETES

Recent trends show that maternal mortality rates are going down in many countries in the Asia-Pacific region. However, maternal mortality continues to remain high in Asia particularly in Bangladesh, Cambodia, India, Indonesia, Lao PDR, Nepal, and Pakistan. The main causes for maternal mortality in Asia are haemorrhage, hypertension, abortion, embolism and sepsis.³ Women with diabetes are ten times more at-risk of dying due to complications in pregnancy as compared to women without the disease, especially those with pregestational diabetes.² The causes of mortality and complications include: ketoacidosis,⁴ hypertension,⁵ and preeclampsia,⁶ ischemic heart disease,⁷ and pyelonephritis.⁸ Post-partum haemorrhage (PPH) is six times more common in women with diabetes during pregnancy than those without diabetes.⁹

Hypertensive complications are also increased in diabetic pregnancies. One in ten cases is known to experience chronic hypertension. Preeclampsia - a condition in pregnant women with increased blood pressure and retention of protein in the urine as a result of kidney malfunction - complicates the pregnancies of 12% of women with diabetes and the risks increase with the duration of disease.

There is a significantly higher risk for hypertension in GDM cases after the index pregnancy (the pregnancy when diabetes was initially diagnosed or detected).^{10, 11} Preeclampsia is hypertension worsened or induced by gestation. It remains a major reason for effecting preterm delivery in diabetic women.

There is significant risk for procedures such as cesarean section and difficult operative vaginal deliveries (e.g. forceps extraction), prolonged and difficult labour, and birth canal trauma for women with diabetes having big babies (foetal macrosomia). These conditions often also set the stage for puerperal infection (bacterial infections post delivery such as fever) and haemorrhage.

Diabetic retinopathy (damage of the retina) and blindness maybe worsened or accelerated during pregnancy although cases may improve sometimes after delivery. It is seen mostly in pregestational diabetes, the prevalence being dependent on length of the disease.

Almost all types of infections are increased in diabetic pregnancies especially with poorly controlled blood sugar levels. These are often seen developing in pregnant women who are unaware of their condition. Recurrent yeast infections (candidiasis of the vulva and vagina), urinary tract infections, respiratory and puerperal pelvic infections are some examples. Moreover, wound (cesarean) infections are increased two to three times.¹²

Women with GDM have a 50% likelihood of developing type 2 diabetes in twenty years. This interval is shorter with poor sugar control during gestation, and the more GDM pregnancies a woman has had. Recurrence of GDM in subsequent pregnancies occurs in 40 to 50% of cases. Additional long-term effects that can arise are associated cardiovascular conditions such as high blood cholesterol, hypertension, and abdominal obesity.^{13, 14}

FOETAL EFFECTS

Perinatal (the period from a few months before birth to about 4 weeks after birth) death rates in pregnancies complicated by diabetes are two to four times more common than in non-diabetics.² Perinatal morbidity is 20 times increased in preeclampsia cases. The increase in morbidity (and mortality) are related to respiratory (breathing) problems which often manifest within a few hours of life, hematologic or blood problems, cardiovascular problems, metabolic and electrolyte imbalances (most common of which is hypoglycemia- abnormally low level of glucose in blood- seen in 20-45% of cases), growth abnormalities and congenital malformations.

The top causes of death are extreme prematurity (often times because delivery is mandated with the onset of hypertensive complications or preeclampsia), respiratory distress, and congenital malformations.

Foetal Macrosomia (big baby) defined as a birth weight of more than 4000 grams is seen in about 20-30% of infants of women with GDM.¹⁵ Increased foetal insulin secretion induced by gestational diabetes is the principal factor in inducing accelerated foetal growth in utero. In addition, insulin-like growth factors (IGFs) are found to be higher in cord blood of affected infants than in normal babies. These IGFs are said to mediate nutrient transport across the placenta. Macrosomia increases the risk for difficult and prolonged labour. The possibility of birth injuries is likewise increased especially with vaginal deliveries. Shoulder dystocia may occur (two to four times higher incidences)¹⁵ in which the baby gets trapped in the birth canal when the well developed shoulders are stuck at the level of the pelvic bone. Significant injuries such as those to the brachial plexus leading to arm deformities, facial nerve palsy, humerus or clavicle leading to fractures, and cephalhematomas (bleeding in the foetal skull), may also occur.

Inadequate growth in diabetic pregnancies could also mean a small for gestational age (SGA) baby. This is a complication occurring in 20% of women with overt diabetes especially if the kidneys are also affected. In these SGA babies, perinatal asphyxia or lack of adequate oxygen in the body tissues is a common consequence.¹⁵ In women with overt diabetes in which vascular involvement is already present, blood flow to the placenta and foetus is compromised and so is nutrient delivery. This in utero malnutrition favours increased tendencies of the foetus to be more efficient in storing glucose into cells for survival. This typical feature called “fat-thin,” is manifested by fat deposition in the abdominal area of the SGA baby.

Congenital anomalies that are increased in these pregnancies are those that involve the central nervous system (caudal regression,¹⁶ spina bifida,¹⁷ hydrocephaly,¹⁸ anencephaly¹⁹), as well as cardiovascular anomalies, underdevelopment of the anus and rectum, and renal system abnormalities. These are seen in 5-10% of cases involving poorly controlled blood sugar and cause about 50% of perinatal deaths in such pregnancies. Congenital abnormalities are three to five times more common in diabetic pregnancies than in normal population.²⁰

Increased incidences of miscarriages and unexplained in utero demise (stillbirths) are also possible when blood sugar is poorly controlled. Miscarriages can be as common as 9-14% especially in the pre-gestational type.¹⁵ Unexplained deaths typically involve large babies at near term (around 35 weeks) prior to onset of labour. There is no apparent cause of death, and this is unique to pregnancies complicated by diabetes. The risk of diabetes in infants of affected mothers has been reported as 1.3% if the mother has type 1 diabetes, 50% if the mother has type 2 diabetes, and 35% if the mother has GDM.

Obesity in pregnant women also increases the risk by 50% of their infants developing DM in later life. Adverse neurologic outcomes such as poor cognitive performance affect about 4% of babies of pregnant women with diabetes.²¹

Foetal Programming and the Intrauterine

Environment: Conditions within the womb may exert effects on the developing foetus that extend well into adult life. Such intrauterine changes may cause epigenetic changes and disrupt normal patterns of foetal development at a critical time. This leads to diseases in adulthood such as hypertension or diabetes. Hyperglycemia in pregnancy is an example of this change causing abnormal growth in the baby.²² A high intrauterine glucose environment stimulates foetal insulin secretion and the evolution of the macrosomic infant. This infant is at risk of developing obesity, increased glucose intolerance and type 2 diabetes later in life. However, maternal undernutrition also pre-programmes the foetus similarly (nutrient mediated teratogenesis). While within the womb, certain genes are switched on causing efficient uptake of available nutrients. Physically, this is seen as fat deposition in the abdominal area of a low birth weight infant. Exaggerated cell uptake continues after birth and into adulthood even when nutrient scarcity no longer exists. This leads to obesity, tissue insulin resistance, and eventually, type 2 diabetes. These effects underscore the importance of good nutrition in pregnant women, even pre-conception, as an important preventive measure.

STRATEGIES TO REDUCE DIABETES MELLITUS PREVALENCE²²

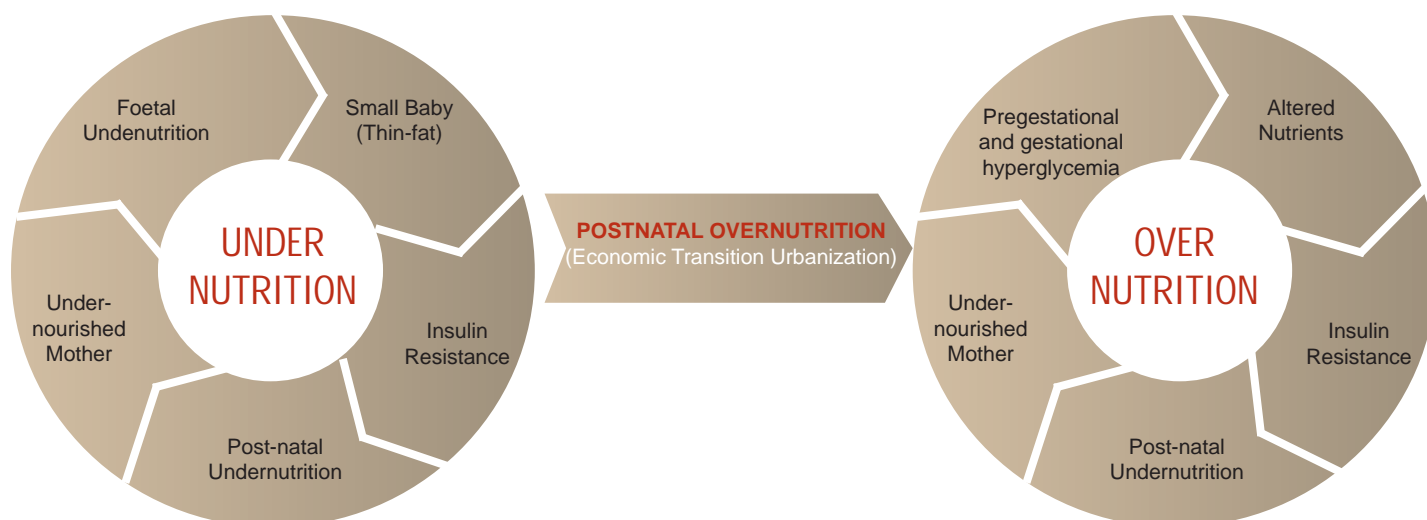
In order to reduce the prevalence of GDM, multi-level strategies need to be employed involving the individuals, communities and community leaders, health providers, governments and policy makers.

INDIVIDUAL LEVEL

Disease awareness and education remains the cornerstone for good disease management and for prevention.

- Women need to be informed of disease risk factors, the importance of adherence to treatment, and the adoption of a healthier lifestyle.
- Girls and women of reproductive age must be given pre-conception counseling and be made aware of the importance of regular prenatal and postnatal care. Health providers are tasked to ensure this information reaches the individuals and to help make healthcare services including maternal care accessible. Open communication between the pregnant women and their providers serves to make these women proactive in terms of combating and managing the disease.
- Furthermore, there is a great need to raise awareness of girls and women about healthy eating.

FIGURE 3. FOETAL PROGRAMMING AND NUTRITIONAL TRANSITION



Source: Yajnik et al. Diabetes Care 2007

PROVIDER LEVEL

- Foremost, the healthcare providers need to be accessible and available for consultation even in resource poor and remote areas.
- There must be a continuing commitment to health education for their clientele (pregnant girls/women) which would include emphasis on the importance of good nutrition for girls, women, and mothers-to-be.
- Providers must lobby for a comprehensive healthcare delivery service that would include maternal healthcare and, specifically, reproductive healthcare services that would include screening for and management and prevention of gestational diabetes. This must be implemented in a coordinated manner with appropriate networking and referral systems in cases of emergencies and the need for higher levels of care.
- The providers must also continue to update their knowledge and skills to render quality healthcare. This would include initiation or active participation in research or surveillance on fetomaternal morbidity and mortality, including those caused by diabetes. Such undertakings would also play an important role in regular assessment, evaluation, and improvement of existing health services in the area served.
- Regular and sustained involvement in local and nationwide diabetes campaigns and initiatives is also necessary.
- Providers need to train and recruit health workers and health advocates, especially for upgrading care in resource poor areas, so that services can cover more communities.

The important role of healthcare providers is within the scope of the four main targets set by the Center for Disease Control and Prevention in maternal health delivery. These are:

a) building partnerships for preventive efforts of type 2 DM in those with GDM,

- b) surveillance of trends and risk factors,
- c) improving postpartum screening, and
- d) improving long-term follow-up in women with GDM.²³

COMMUNITY LEVEL

- Community leaders and their constituents need to organise, mobilise and support activities for the promotion of healthier lifestyles. In the Philippines, this is exemplified by the holding of “fun runs” and church-organised “soup kitchens” that promote exercise and good nutrition.
- Leaders should advocate for diabetes to be viewed as a primary health concern and help mainstream diabetic screening and care as part of comprehensive reproductive health care.
- Communities can organise sustainable preventive practices that promote sustained diabetes awareness campaigns. These would include local food and nutrition programs, public information and health education.

POLICY AND DECISION MAKERS LEVEL

- Governments must design, implement, and monitor nationwide comprehensive healthcare and information programmes in diabetes.
- It is also necessary to conduct regular surveillance on GDM and diabetes especially as these statistics will help in the quality assurance of such health services.
- Governments must make diabetes health concerns a priority in the nationwide health budget allotment as logistics and other support must be provided for sustained diabetes programmes throughout the country. Importantly, there needs to be sustained funding for screening and other services, and continuous training of healthcare workers. It is vital that quality healthcare be accessible and affordable to the public.

Box 2. The Community Healthcare Worker: A Unique and Important Role in Reducing DM and GDM²³

Especially in remote rural areas, community healthcare workers (CHWs) play an important role in the healthcare delivery system. They serve as a bridge between the culture of the locale and the healthcare system, providing information and input as to what healthcare strategies are likely to work or be accepted by the people in the community. The CHWs also provide assurance that the community health needs are met. They are the direct providers of basic health services and screening tests as physicians are not readily available. As extensions of health services from the city or urban centers, they serve to empower their locality to take a proactive stand in health concerns. The involvement of an enlightened and trained CHW in providing information about diabetes, the risk factors and measures to alleviate these risks can play an important role for diabetes prevention in general. In relation to GDM these health workers can play an important role in ensuring screening for diabetes during pregnancy and in counseling women on the importance of antenatal care, healthy lifestyle etc.

- Laws need to be instituted that will ensure that medicines are available at affordable prices or even provided for free for the poor.
- Policies to safeguard quality medications and food must be put in place.
- Funding for diabetes research and training should also be provided.
- Lastly, an ongoing nationwide campaign is needed to combat malnutrition or poor nutrition, and to promote healthy lifestyles.

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fuel source, instead uses fat and protein sources. The products of this process are acids called ketones which are highly toxic. It is more commonly seen in type 1 diabetes, but can also develop in those with type 2 diabetes. Clinical manifestations include: dry skin and mouth, flushed face, nausea and vomiting, stomach or abdominal pain, breathing difficulty, decreased appetite, coma and deterioration of consciousness, dulled senses, fatigue, frequent urination or thirst for many days, among others.

- 5 Hypertension is the rise of blood pressure to or above 140/90 mmHg.
- 6 Preeclampsia is a condition in pregnant women with increased blood pressure and retention of protein in urine as a result of kidney malfunction.
- 7 Ischemic heart disease is the ailment of the heart caused by poor supply of blood to the heart muscles.
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- 16 Caudal regression is a congenital anomaly characterised by failure of development of the lower (caudal) portion of the spine. The range of defects includes partial absence of the tail bone area of the spine to that of the lower vertebrae, pelvis and spine. These anomalies can also come with neurologic impairment, paralysis of the underdeveloped lower extremities, and incontinence (inability to hold urine).
- 17 Spina bifida is a congenital anomaly characterised by incomplete closure of the developing neural tube hence the presence of an opening in which parts of the spine may protrude as the overlying vertebrae are un-fused. The term in latin means “split spine”.
- 18 Hydrocephaly or “water in the brain” is an anomaly characterised by abnormal accumulation of brain fluid (cerebrospinal fluid or CSF) in the brain cavities (ventricles) leading to gradual elevation of pressure in the skull. Because of this, affected babies manifest with enlarged heads, seizures, tunnel vision, mental disability and even death.
- 19 Anencephaly is a congenital anomaly belonging to the spectrum of spina bifida in its most severe condition. In this condition the calvarium fails to develop or fuse thus the brain is entirely exposed.
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DIABETES AND SEXUALITY: A MISSING LINK

“Stereotypes on sexuality, gender, aging and diabetes, of and by women, men and health providers, bias the communication, reporting, diagnosis and treatment of sexual health issues in diabetic women and men.” - Dr. Hoang Tu Anh

INTRODUCTION

Advances in medicine have greatly improved the diagnosis, treatment and care of people living with diabetes, leading to a better quality of life. Women and men with diabetes live longer with fewer negative consequences of the disease. However, much of the focus in diabetes treatment, care, and research is still on disease prevention. Sexual health and sexuality are integral parts of human beings and yet they receive very little attention. Socio-cultural norms that put sexual health and sexuality in the ‘closet’ pose great barriers to talking about sexual problems in an uninhibited manner. Within the medical field too, sexual health and sexuality are often neglected, which subsequently affects health and well-being. This is true of diabetes too, as is evident from the fact that very little information is available on the sexual aspects of diabetes.

As has been elaborated in the earlier chapters of this publication, women are affected more by the negative health impact of diabetes (Kapur, Cruz). This is partly attributed to their reproductive roles of childbearing and care giving. Women’s health also receives far less attention than men’s health, contributing to poor health outcomes for women. Furthermore, gender aspects – biological and socio-cultural – are seldom taken into account in health provision and care, thereby leading to differential gender outcomes of health for men and women.

This paper seeks to highlight the important links between diabetes and sexual health in men and women, and the role of gender in both, receiving and giving treatment. It also aims to identify some limitations in current health services response to the needs of women and men with diabetes. The paper argues that the sexual health concerns of women and men with diabetes are not just rooted in physiology/ biology.

Social norms on sex and sexuality of women and men and the traditional gender norms of women and men in general play an important role in shaping the attitudes and practice of health providers in dealing with the issues. The paper calls for the integration of gender and sexuality in noncommunicable diseases interventions and for comprehensive sexuality education not only for people with diabetes but also for health providers to improve healthcare services including counseling for women and men with diabetes.

DIABETES & SEXUALITY

There is ample evidence and literature on the impact of diabetes on the sexual health of men and women with this condition. These range from reduction in sexual desire to difficulties in having sex and sexual dysfunction. These problems are due to the fact that chronic hyperglycemia causes reduced blood flow as well as damage to the nerves and vasculature. In addition, people with diabetes are also at higher risk of infections and associated complications that significantly influence sexual health.

The most known sexual problem reported in men with diabetes is erectile dysfunction.¹ About 75% of men in general with type 2 diabetes have erectile dysfunction. Other issues include lack of libido, retrograde ejaculation, early ejaculation, inflammation of the penis head and testosterone deficiency leading to reduction of sexual desire.² On the other hand women with diabetes suffer from painful intercourse, orgasmic dysfunction and loss of libido. High blood sugar causes the vagina to become dry, making sex a painful experience. As has been mentioned before, diabetes damages the nerves, reducing blood flow during arousal, decreasing lubrication and clitoral stimulation. Tiredness, which is commonly an outcome of diabetes, is another reason for reduction of sexual desire. As people with diabetes are vulnerable to bacterial infections, high blood sugar increases the risk of genital infections such as Candida, as well as urinary infections. The risk of urinary incontinence especially for women with diabetes is between 50% and 200% greater than women without diabetes. Earlier menopause is seen in women with diabetes type 1.³

THE GENDER FACE OF SEXUALITY AND DIABETES

Although, most of the differentials in sexual health problems for women and men with diabetes arise from biological differences, the actual differentials in diagnosis, treatment, and care of women and men arise from ascribed and perceived gender roles and sexuality of both sexes. For example, gender norms ascribe women to be shy and not talk about matters related to sex and sexuality. Studies also show that less than 30% of female clients with sexual problems discuss treatments with their general practitioners,⁴ and only one third of these are likely to accept medication.⁵ Very few women would raise the issue of hypoactive sexual desire disorder (HSDD) or sexual aversion disorder (SAD) as a primary problem when talking with their health provider as the majority think that it is not appropriate for women to talk about sexual desire and that it is normal for women to have low sexual desire.⁶

For men with diabetes, sexual health problems are seen as both physical and mental causes. However, men often believe that their sexual health issues are purely organic. Hence, they have a tendency towards the overuse of medication and surgery. Many of them refuse psychological counseling as treatment. In a study sample of 76 men with erectile failure referred for sex therapy, only 13 men initially entered therapy, and the 13 who were re-contacted discontinued sex therapy for fear of being labelled as having psychological problems, and did not want their wives or sex partners to know they were undergoing treatment.⁷ Older men tend to underreport sexual problems as they believe that it is normal to have reduced sexual interest with age.⁸

The conventional norms of beauty also makes women with diabetes suffer more than men. Women are often more under pressure to fit the stereotypical slim look. Women often have lower self esteem if they see that their body does not fit the social expectation of beauty. As diabetic women tend to be obese/overweight, they are more likely to suffer low self esteem. This consequently influences their sexual performance and sexual relationships. Research shows that only 37% of obese women think they are attractive. 63.6% of women in comparison with 43.8% of men with obesity do not enjoy sex. 61.2% of women in comparison with 28.7% of men state that they have little sexual desire because of obesity. 56.5% of obese women in comparison with 49.4% of men have difficulty in sexual performance. 54.7% of obese women avoid sexual encounters while only 35.5% of obese men do so.⁹

ISSUES OF HETERONORMATIVITY

Heteronormativity is a term that implies that people fit into tight categories of men and women and that they play the normative gender roles as ascribed and defined by their biology/sex. This implies that those who do not ascribe to their normative roles as being men and women are “not normal.” In this light, heterosexual relationships, i.e. between male and female, are considered to be the “normal” sexual orientation. The diagnosis and treatment of sexual health problems related to diabetes in women and men are very much formed and dominated by traditional discursive ideologies about heterosexual and penetrative sex (between male and female). Thus, sexual dysfunction in men, such as erectile disorder, is often perceived by health providers as a very serious problem as this affects the male functions of procreation. However, Schmitt and Neubeck (1985) found in their research that the impact of erectile disorder is very much dependent on how couples communicate and perceive it. They identified three factors that contribute to the reduction in the negative impact of erectile failure within the marriage. These are:

1. the couple understood the medical linkage between erectile failure and diabetes,
2. the couple saw the erectile failure as “their” rather than “his” problem, and
3. the couple had good, open communication about the sexual and other aspects of their relationship.

Hypoactive sexual desire disorder (HSDD):
The persistent or recurrent deficiency (or absence) of sexual fantasies/thoughts and/or desire for or receptivity to sexual activity, which causes personal distress.

Sexual aversion disorder (SAD):
The persistent or recurrent phobic aversion and avoidance of sexual contact with a sexual partner, which causes personal distress.

International classification of female sexual disorder in Wylie et al. 2010

Heteronormativity in diagnosis and treatment of sexual health problems of diabetic women and men is a big barrier to improving sexual performance, sexual relationships, and the quality of life for both women and men. Moreover, it reinforces the traditional norms of gender and sexuality and limits the couple's capacity to develop a healthy sexual relationship and to discuss their sexual health concerns if they are homosexual or transgender.

LIMITED AND GENDER-BLIND RESPONSE OF HEALTH PROVIDERS TO SEXUAL CONCERNS OF WOMEN AND MEN WITH DIABETES

Though sexual health issues are mentioned in almost all text books on diabetes, they often do not get a similar level of attention in practice. Most health providers do not talk with patients about sexual concerns during regular health check-ups. In addition, diabetic patients are not comfortable with asking doctors about their sexual concerns. In the reports on the consequences of diabetes, there is no mention specifically of the link between diabetes and sexual health concerns other than HIV and AIDS.¹⁰

Gender stereotypes about male and female sexuality influence the communication of health providers and male and female clients regarding sexual concerns. Having their own gender biases, physicians often have different responses when they meet female and male patients with concerns about their sexual and reproductive health. For example, many health providers believe that male patients are much more concerned about sexual issues than female, and that diabetic men experience twice as much dysfunction as diabetic women. Health providers also often believe that men's issues are purely organic and women's issues are purely psychological. With this gender bias, doctors routinely discuss sexual concerns nearly three times as much with male diabetic patients as with female. Many of them also think that the referral for treatment of sexual problems is much more important for men than for women.² Health providers at primary care settings are not capable in making diagnoses of sexual health issues. 90% of respondents had little confidence in making a diagnosis of HSDD¹¹ and 90% had not screened a patient for HSDD. One study with people aged 40–80 years also found that only 8–10% of respondents had been asked about their sexual health during a routine visit to their doctor.¹²

CONCLUSION

The negative consequences of diabetes on both women and men are indisputable from the evidence available. The great negligence of the issue of sexuality in diabetes diagnosis and treatment is not merely due to the incompetence of health professionals in addressing the issue. Social and cultural aspects including attitudes towards sex and sexuality, and expected gender norms of sexuality for women and men are important factors that impede open communication about these issues between diabetic people and their health providers. Gender stereotypes, sexual normativity, and social expectations of women, men, and health providers about sexuality, gender, and ageing as well as diabetes biases, affect communication, reporting, diagnosis, treatment, and care of sexual health issues in diabetic women and men.

RECOMMENDATIONS

To realise the comprehensive sexual and reproductive health and rights for women and men with diabetes, it is important that:

- Sexuality be included in medical and nursing training on diabetes diagnosis and treatment in a gender and culturally sensitive manner that deconstructs sexual norms,
- Women and men with diabetes should be screened for sexual health problems. Sexuality should be included in education programmes for people with diabetes – that is, women and men, including adolescents and young people,
- Treatment of sexual health problems for women and men with diabetes should consider both organic and psychological issues in a comprehensive way, and
- There should be more research on women and diabetes, and gender and sexuality in the region and on alternative treatments including psychotherapy for sexual health issues for women and men.

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DIABETES & SRHR:
WHAT CAN WE DO TO BETTER THE LIVES
OF WOMEN?

"Current commitments and funding opportunities for NCDs need to be used to intergrate diabetes into SRHR and to put in place effective screening, prevention and control of diabetes mellitus." - Dr. Narimah Awin

SUMMARY AND CONCLUSION

The three papers in this publication have described the main issues related to diabetes in women, especially in the context of diabetes being the "missing link" in reproductive health. These papers have successfully collated and synthesised the resolutions made at the 83rd plenary session of the UN General Assembly in December 2006, which addressed the issues of (i) undiagnosed and untreated diabetes during pregnancy; (ii) maternal nutrition and the future risk of diabetes and noncommunicable diseases in low birth weight babies; and (iii) the broader issue of women and diabetes, especially in the context of development. This third issue is especially relevant to the rights agenda, which was brought to international attention at Cairo (International Conference on Population and Development, ICPD) and Beijing (Fourth World Conference on Women, FWCW), following which governments pledged to adopt the rights approach to women's health, an approach that ensures equity, accessibility, affordability, acceptability, and quality.

In the first paper the overview and basic concepts presented by Dr. Kapur provides a useful starting point and basis for a consideration of this issue. The global epidemiology of diabetes mellitus and its analysis of diabetes in male and females, convincingly drives home the point of why more attention needs to be paid to diabetes in women. The paper introduces us to the issue of gestational diabetes mellitus (GDM), and its consequences to pregnancy and perinatal outcomes, and to the concept of foetal programming (which is further expanded upon by Dr. Jessica Ona-Cruz). It is noteworthy that Dr. Kapur emphasised the gender aspect of diabetes, gender being a social construct; therefore women with diabetes are disadvantaged both biologically by being of the female sex and socially by being of the female gender. This aspect needs emphasis in the context of women and development and gender equality, and therefore of rights, as called for by international conventions notably the ICPD, FWCW, and the Millennium Development Goals (MDGs) 2000. This introductory paper gives adequate evidence for drawing the conclusion that diabetes in women is an important public health problem that deserves more attention.

Dr. Jessica-Ona Cruz listed and briefly described risk factors to GDM, and provided a detailed and explicit description of the wide range of effects of GDM on both the mother and foetus. The concepts and consequences of foetal programming in the context of diabetes were expanded, building on the introduction given earlier by Dr. Anil Kapur. Strategies from the perspectives of the individual, the health providers, community, and policy

makers, were suggested, with emphasis on what the maternal and child health service can and should do. This effectively brings home the point and concludes that as far as reproductive health and MCH are concerned, diabetes mellitus remains a "missing link."

An important aspect of reproductive health is sexuality, a subject to which even less attention is paid, as it is a sensitive topic that is often "kept in the closet." Dr. Hoang Tu Anh presented the role of diabetes in the sexual life of both men and women, who suffer not only the physical consequences of disturbed sexual functions, but also psychological consequences such as anxiety, depression, and lowered self esteem. It is noteworthy that while diabetes and reproductive health do not get the attention they deserve, this neglect is even more pronounced with respect to sexuality and sexual health. Health providers including endocrinologists and other doctors managing diabetic patients are often not comfortable with talking about sexuality. Dr. Hoang pointed out that education and information on diabetes seldom address the issue of sexuality. With gender stereotyping, both by the public and by service providers, women having diabetes are further disadvantaged. In conclusion, it was reiterated that sexuality, a neglected area in health, is even more neglected in the context of men and women with diabetes mellitus.

RECOMMENDATIONS

These three papers, and the discussions at the symposium where they were presented provide a good platform for the following recommendations:

- **Creating and raising awareness** – diabetes in women including GDM is an important matter, based on the magnitude of the problem (numbers affected) and the seriousness of the consequences. Awareness needs to be heightened among the public, the health professionals, and the policy makers. This can be achieved by various means: optimising all possible media such as electronic media, posters, campaigns, public forum etc. A champion, in the form of a well known and inspiring personality, is also likely to enhance awareness.
- **Advocacy to ensure due attention is accorded to diabetes and women including GDM** – once policy makers are aware of the problem and the need to intervene, advocacy is needed to ensure that interventions are put in place. Such advocacy is most likely to have results if it is promulgated by the medical fraternity itself - especially specialists in maternal health and in diabetes and in NCD - to policy makers; as well as by women's groups who can exert pressure especially using the rights platform. Health economists

will have a role to put forth the cost benefit argument.

- **Mainstreaming or integrating diabetes in reproductive health** – managers and service providers of reproductive health services are in an advantageous position to integrate diabetes into their programmes, so that services will not be stand-alone, vertical, fragmented, and unlinked. There is need to systematically deliberate on appropriate interventions and other programmatic issues. A fitting beginning would be making policies for all pregnant women, with priority given to high-risk women, to be tested for diabetes, and to take the appropriate follow-up actions. For this to happen, much can be done at primary health care (PHC) level where the largest number of women avail of health services. In Malaysia, for example, the Primary Care Physician (Family Medicine Specialist) introduced in the mid-1990s offers an opportunity for specialist care at PHC, which is an enabling factor for NCD and GDM management at PHC, and for appropriate referral.
- **Integration and linkage need to be assured not only in terms of referral within the health system, but also from the perspective of the life stages of the woman.** In other words, attempts to prevent NCD and diabetes and GDM must take the life cycle approach – from pre-pregnancy, to antenatal and postpartum care, along with newborn care, then to the girl child and adolescent who will enter the cycle as a pre-pregnant woman. Adequate nutrition and proper diet are central in each of these stages of the life course, and programmes to ensure these, along with the other life style determinants of NCD, need to be put in place.
- **A concerted effort among international development partners to provide support may be required** in many developing countries where the problem of GDM is significant and requires intervention, and health systems are weak. The WHO, as the leading organisation for health, should begin to examine its role in terms of technical support for countries by introducing programmes and services for GDM including screening of pregnant women. An important programmatic input is a reliable information system, and for a start there needs to be segregation of data by gender. Besides the WHO, other international development partners can potentially enhance the responses in dealing with this problem, by supporting countries with technical expertise, guidelines and tools, and, not least, with financial resources. This would enable resource-constrained countries to start initiatives to address the problem.
- **Research and evidence generation is needed to provide answers to several questions regarding diabetes and women, and concerted efforts need to be made towards this.** This can be in the form of primary research, such as uncovering the unanswered questions on the patho-physiology of GDM and foetal programming; or operational research such as identifying the barriers for universal screening of pregnant women; or social research such as determining the socio-cultural parameters that influence the detection/management of GDM, and research in health economics to show cost benefit of interventions.

Such evidence is needed for policy formulation and programme planning.

- **The issue of sexuality needs to be addressed.** Sexuality is even more neglected than GDM and women's health. Although it is one of the five components of reproductive health in the "Global Reproductive Health Strategy of WHO", it has garnered the least attention, mainly due to its status as a sensitive subject. There is urgent need to create awareness through appropriate channels, with messages that are scientifically accurate, and which at the same time take into account cultural sensitivities. The medical professionals themselves need to be adequately educated on this topic, and medical/health/nursing curriculum both pre-service and in-service, need to incorporate human sexuality.

OPPORTUNITIES

To facilitate the implementation of these recommendations, there are several opportunities and avenues that can enhance the visibility of this problem, including:

- **The ICPD (1994) recommendations**, one of which was "All countries should strive to make accessible through the PHC system, reproductive health to all individuals of appropriate age, as soon as possible and no later than 2015." Although this recommendation is not specific and refers to reproductive health in general, it must be borne in mind that there are many conditions such as GDM that directly influence reproductive health, and also that ICPD's emphasis is that of rights to women's health in the context of gender equality.
- **The Millennium Development Goals** – although diabetes (or indeed NCDs) is not specifically provided as a goal, countries are encouraged to implement programmes for achieving MDGs according to their own needs and situations, and indeed, several have embarked on "MDG plus." Some of these have incorporated maternal morbidity under MDG5 which is after all "to improve maternal health" although reducing maternal mortality is the highest priority. Besides MDG5, the management of GDM and diabetes in women in general will also contribute to MDG4 (child survival) and MDG3 (gender equality).
- **The Global Reproductive Health Strategy** endorsed by the World Health Assembly in 2004, calls for strengthening and ensuring access to reproductive health and for reducing maternal morbidity and mortality. Again, although specific mention of diabetes is not made in the scope of reproductive health, the strategies for improving reproductive health will have to take into account all matters that affect reproductive and sexual health, such as DM and GDM.
- **The current knowledge about foetal programming and inter-generational transmission of disease** provides an opportunity for interventions and investigations regarding pregnancy to be expanded.
- **The current interest and global attention on noncommunicable disease** is another strong platform for pushing forward the agenda for diabetes, including diabetes in women and GDM. In this regard the UN Secretary General's Report on NCD, and the UN General Assembly's Political Declaration on NCDs adopted on 19 September 2011, will serve as useful frameworks for

action.

- **Finally, the revival of PHC**, especially to achieve equity and universal access, is an opportunity for countries to revise and enhance their PHC programmes to include newer areas of concern such as NCD prevention and management of GDM in the essential service package for PHC. This will also offer opportunities to strengthen existing related services especially nutrition of mothers, infant, and young children, including breastfeeding.

If all or some of these recommendations can be carried out, some progress is expected in alleviating the problem of diabetes and women, GDM, and improved health and wellbeing, including SRHR. The next challenge will be to ensure sustainability.

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Dr Narimah Awin, a medical doctor by profession with a Masters degree in Public Health, is currently the Regional Advisor for Maternal and Reproductive Health at the WHO Regional Office of the South East Asia Region (WHO-SEARO). Prior to taking this post, she held a similar position at the WHO Regional Office for the Western Pacific Region in Manila (2007 – 2010), where, in 2009, she initiated discussions with officials in the Ministry of Health, China about looking at the issues of gestational diabetes. From 2000-2007 she was the Director of Family Health and Primary Health Care in the Ministry of Health, Malaysia. She can be contacted at: awinn@searo.who.int



RESOURCES

Berer, M. (Ed.). (2011). Repoliticising sexual and reproductive health and rights. *Reproductive Health Matters*. 19(38), November 2011, 245p.

This issue of the RHM journal demonstrates the need to re-politicise and re-prioritise the sexual and reproductive health and rights agenda in the context of a fragmented SRHR movement and the weakened comprehensive agenda of the Cairo and Beijing conferences. The articles include revised versions of the papers presented at a global meeting by the same title held in August 2010. They analyse in-depth the extent of the depoliticisation of health and health

policy in SRHR, and especially look at the role of MDGs, macroeconomic influences on health, public health education in universities, the role of the pharmaceutical industry, human rights approaches, funding, and the perpetuation of power. The journal issue cautions that if appropriate steps are not taken to revisit and reflect on where we are going we are unlikely to achieve health and SRHR for all. It is recommended that this journal issue be read together with the meeting report, available at www.arrow.org.my/publications/Langkawi_Report.pdf

International Diabetes Federation. (2011). *IDF Diabetes Atlas*, 5th ed. Brussels, Belgium: IDF. Available at www.idf.org/diabetesatlas



The diabetes atlas is an authoritative source of evidence on the burden and scale of diabetes. This fifth edition presents data on the magnitude and prevalence of diabetes and impaired glucose tolerance for 216 countries for the year 2011, and makes projections for 2030. The estimates for 2011 and 2030 exceed those reported in the 4th edition in 2009, showing the rapid growth of the disease. Data and

analyses for 7 regions namely Africa, Europe, the Middle East and North Africa, North America and the Caribbean, South and Central America, South-East Asia, and the Western Pacific are also provided. In addition, the atlas includes a description of the different types of diabetes, symptoms, causes, and complications of the disease; resources and solutions, with an overview of the global diabetes plan and action framework, guidelines and

position statements; analyses on the linkage between diabetes and development; advocacy at the global level; references, background papers, detailed data, and interactive maps and figures. The atlas is a useful tool for health professionals, scientists, economists, policy makers, and national and international agencies

Jiwani, A. et al. (2011). Gestational diabetes mellitus: Results from a survey of country prevalence and practices. *The Journal of Maternal-Fetal and Neonatal Medicine*, 2011.1-11.

This study assesses the country level prevalence of GDM, and GDM screening and management practices in 173 countries. Findings show that the GDM prevalence ranged from <1% to 28%, and 74% of countries that completed the survey have national GDM guidelines or recommendations. A variety of screening practices were found and many countries did not perform systematic screening for GDM, and practices often diverged from guidelines. The study recommends that countries need to carefully assess the cost and health impact of scaling up GDM screening and management in order to identify the best policy options for their population.

Racherla, S.J. (Ed.) (2011). *Reclaiming & redefining rights - thematic studies series 4: Maternal mortality and morbidity in Asia*. Kuala Lumpur: ARROW. 205p. Available at www.arrow.org.my/publications/ICPD+15Country&ThematicCaseStudies/MaternalMortality&MorbidityinAsia.pdf

This publication is the fourth in the thematic studies series on "Reclaiming and redefining rights ICPD+15: Status of sexual and reproductive health and rights in Asia". Using indicators related to prevention of maternal deaths and maternal morbidities, and the promotion of maternal health and wellbeing the study focuses on the issues of maternal mortality and morbidity in six countries in Asia. Regional findings on the status and causes of maternal deaths and disabilities, and essential interventions needed to prevent maternal deaths from 12 countries in Asia, is substantiated with qualitative case studies from China, India, Lao PDR, Nepal, Pakistan and the Philippines. These national studies explore specific issues related to maternal health such as availability of skilled attendance at birth, post-partum care, emergency obstetric care, antenatal care, obstetric fistula, uterine prolapse, adolescent birth rates, and anemia and nutritional status in these countries.

Roura, L.C., Hod, M., Kapur, A. & Lohse, N. (Eds.) (2011). Early origins of health: The role of maternal health on current and future burden of chronic noncommunicable diseases. *International Journal of Gynecology & Obstetrics*. 115(Supplement 1). Available at [www.worlddiabetesfoundation.org/media\(10447,1033\)/ElsevierSupplementNov2011_EarlyOriginsOfHealth.pdf](http://www.worlddiabetesfoundation.org/media(10447,1033)/ElsevierSupplementNov2011_EarlyOriginsOfHealth.pdf)

While the link between early origins of health and lifelong

health risks of diseases -referred as the Developmental Origins of Health and Disease (DOHaD) – is not new, it is only gaining recognition now because of the substantial evidence pointing to the linkage. This supplement brings together articles that shed light on the intergenerational effects of NCDs, the importance of early intervention to prevent and control risks of diseases, and the negative outcomes of neglect. A broad range of topics covered in this volume include: new insights into developmental origins of NCDs and interventions to reduce risks early in the life-course; the impact of obesity and maternal nutrition on pregnancy and child health outcomes; links between maternal anemia, communicable and noncommunicable diseases such as malaria, tuberculosis, HIV, and diabetes; low-cost models for effective GDM screening and management; interventions for the prevention of NCDs, including integrating NCD prevention into maternal and child health programmes, using evidence to promote healthy pregnancies, using media as an advocacy tool for reaching policy makers as well as a wide population, and fostering collaboration among different stakeholders to reverse the development of NCDs.

The NCD Alliance. (2011). *Non-communicable disease: A priority for women's health and development*. New York: The NCD Alliance. 20p. Available at www.theunion.org/index.php/en/resources/scientific-publications/item/755-non-communicable-diseases-a-priority-for-womens-health-and-development

This report draws attention to the needs and challenges of girls and women at risk of or living with NCDs. Through case studies and personal experiences of women it shows the specific vulnerabilities, stigma, social and economic costs and barriers for girls and women with NCDs. Summaries on women and specific chronic diseases such as cancer, cardiovascular disease, chronic respiratory disease, and diabetes provide quick facts on the issues. The report calls for political will and right policies to control and prevent NCDs.

World Health Organization. (2011). *Global status report on noncommunicable diseases 2010*. Geneva: WHO. xii+164p. ISBN: 9789240686458. Available at http://whqlibdoc.who.int/publications/2011/9789240686458_eng.pdf

This is the first report presenting the current state of NCDs worldwide, and provides the baseline data for assessing progress on addressing the issue as well as for monitoring future trends. Chapters in the report highlight the burden of the epidemic and the factors contributing to the increasing trend in NCDs, impact of NCDs on development and poverty, especially in low- and middle-income countries, which are bearing the bulk of the disease, the need for population-wide interventions for prevention and control of diseases, and strengthening of surveillance and monitoring of NCDs. It sets out priority actions to reverse the advance of the epidemic through better surveillance, prevention, and healthcare.

World Health Organization. (2011). *Noncommunicable diseases country profiles 2011*. Geneva: WHO. 209p. ISBN: 9789241502283. Available at http://whqlibdoc.who.int/publications/2011/9789241502283_eng.pdf

This report provides an overview of the noncommunicable diseases (NCDs) situation in 193 countries. It uses the methodology used by the “Global status report on noncommunicable diseases 2010” and provides an analysis of mortality by NCDs, the current status and trends in risk factors, and country capacity to address and respond to NCDs. The analyses are followed by a snapshot and graphical presentation of the total population as of 2010, total NCD deaths, the causes and prevalence of behavioural and metabolic risk factors, and finally the country capacity to address and respond to NCDs. The indicators related to the country capacity are infrastructure, financing, surveillance, policy/strategy development, and implementation of key tobacco policy measures. The report aims to provide the required information for countries to firstly have an overview of the NCDs situation, and secondly to monitor and control them.

Hogan, M.C. et al. (2010). Maternal mortality for 181 countries, 1980–2008: A systematic analysis of progress towards Millennium Development Goal 5. *The Lancet*, 375, 1609–23.

This study assessed levels and trends in maternal mortality for 181 countries covering the period 1980–2008, based on vital registration data, censuses, surveys, and verbal autopsy studies. It found a decrease in maternal deaths worldwide from an estimated 342,900 in 2008 to 526,300 (446,400–629,600) in 1980; a decrease in global MMR from 422 in 1980 to 320 in 1990. MMR was 251 per 100,000 live births in 2008. The yearly rate of decline of the global MMR since 1990 was 1.3% (1.0–1.5). More than 50% of all maternal deaths occurred in only six countries in 2008 (India, Nigeria, Pakistan, Afghanistan, Ethiopia, and the Democratic Republic of the Congo), three of which are in Asia. Analysis of the data shows that substantial, albeit varied, progress has been made towards MDG5. Although only 23 countries are on track to achieve a 75% decrease in MMR by 2015, countries such as Egypt, China, Ecuador, and Bolivia have been achieving accelerated progress.

Sami, M., DANIDA & WDF. (2010). *The emerging burden of chronic diseases and its impact on developing countries: Conference report, 15 – 16 April 2010, Copenhagen, Denmark*. Copenhagen: Danida & World Diabetes Foundation. 32p. ISBN 9788770874335. Available at [www.worlddiabetesfoundation.org/media\(9534,1033\)/NCD_Conference_Report.pdf](http://www.worlddiabetesfoundation.org/media(9534,1033)/NCD_Conference_Report.pdf)

This report summarises the conference proceedings through a synthesis of presentations and discussions. Presenting data and other evidence, it highlights the growing trend of chronic noncommunicable diseases,

the risk factors and misconceptions about NCDs, costs and cross-sectorial approaches for prevention, and calls for urgent collective action to stem the progress of NCDs.

World Health Organization et al. (2010). *Trends in maternal mortality: 1990 to 2008, estimates developed by WHO, UNICEF, UNFPA and The World Bank*. Geneva: WHO. 55p. ISBN: 9789241500265. Available at http://whqlibdoc.who.int/publications/2010/9789241500265_eng.pdf

An important reference when assessing the progress of MDG5a, this report covering the period from 1990 to 2008, claims that the maternal deaths worldwide have dropped by a third. While the progress is notable, in order to realize the Millennium Development Goal (MDG) target, maternal mortality has to decline at a rate of 5.5% per year. Because of the major gaps in both qualitative and quantitative data in maternal mortality, trends are calculated through statistical modeling. It highlights that: ten out of 87 countries with maternal mortality ratios equal to or over 100 in 1990, are on track with an annual decline of 5.5% between 1990 and 2008, while 30 made insufficient or no progress since 1990; maternal mortality decreased by 26% in sub-Saharan Africa; in Asia, the number of maternal deaths also is estimated to have dropped from 315,000 to 139,000 between 1990 and 2008, a 52% decrease; and 99% of all maternal deaths in 2008 occurred in developing regions, with sub-Saharan Africa and South Asia accounting for 57% and 30% of all deaths respectively. The estimates show that preventing pregnancy and child birth related deaths is possible through investments in the national health systems and improving quality of care.

Hod, M., Wolfson, E. & Lefebvre, P. (Eds.). (2009). *Diabetes, women, and development. International Journal of Gynecology & Obstetrics, 104(Supplement), S1-S50.*

This supplement compiles papers presented at the “Diabetes, Women, and Development UN Expert Meeting”, held on April 8, 2008, at the United Nations Headquarters in New York, USA. The articles fall within the three major themes of the meeting: undiagnosed and untreated diabetes during pregnancy; maternal malnutrition and the future risk of diabetes and noncommunicable diseases (NCDs) in low birth weight babies; and women and diabetes. The supplement also covers gestational diabetes, gender inequalities of access to diabetes care and treatment, the social and economic consequences of diabetes in women from low-income countries, diabetes screening, pregnancy and diabetes scenarios in Africa, China and India, and makes recommendations for policy action.

IDF Clinical Guidelines Task Force. (2009). *Global guideline on pregnancy and diabetes*. Brussels: International Diabetes Federation. 33p. Available at www.idf.org/webdata/docs/Pregnancy_EN_RTP.pdf

The guideline provides an understanding of the risks of

diabetes in pregnancy for the woman and the child, and the means of identifying women with diabetes. Topics covered are gestational diabetes mellitus, identification, testing, management, control and prevention of diabetes in women before, during and after pregnancy. It presents evidence from research studies on various aspects of diabetes in pregnancy and makes recommendations for standard care, including pre-pregnancy counselling; prenatal visits; management of diabetes during pregnancy, GDM, and post delivery; breastfeeding; and follow-up testing for diabetes after delivery.

Reichenbach, L. & Roseman, M. J. (Eds.). (2009). *Reproductive health and rights: The way forward*. Philadelphia: University of Pennsylvania Press. viii, 292p. ISBN: 9780812241525

This collection of critical essays by leading experts from diverse disciplines asserts that the International Conference on Population and Development (ICPD) agenda still has great merit. It grapples with the fundamental questions about the relationships among population, fertility decline, reproductive health, human rights, poverty alleviation, and development, and assesses the various arguments – demographic, public health, human rights-based, and economic – for and against ICPD today even as it explores shortcomings and recommends ways to strengthen the reproductive health and rights approach.

Thanenthiran, S. & Racherla S. J. (2009). *Reclaiming & redefining rights – ICPD+15: Status of sexual and reproductive health and rights in Asia*. Kuala Lumpur: The Asian-Pacific Resource & Research Centre for Women (ARROW). 161p. ISBN: 9834423421. Available at www.arrow.org.my/images/publications/ICPD+15/Reclaiming&RedefiningRightsICPD+15.pdf

This monitoring report is the third in the review of ICPD Programme of Action (PoA) monitoring done by ARROW and her partners. It takes a comprehensive look at the status of SRHR across 12 countries in Asia, 15 years after the landmark conference in 1994. Covering five critical areas of women's empowerment, reproductive health, reproductive rights, sexual health and sexual rights, it reports that progress across the 12 countries reviewed is uneven. To ensure that the ICPD and MDGs are met, the report makes four key recommendations: i) policy changes that are underpinned by commitment to the ICPD PoA and are respectful of reproductive rights and sexual rights; ii) ensuring universal access to affordable, quality gender-sensitive SRH services through functional and integrated health systems, starting from the primary health care level; iii) continued and sustained investments in women's SRHR by both the government and the donors; and iv) improvement of access to services of adolescents, marginalised groups of women and those with diverse sexual orientation and gender identities.

OTHER RESOURCES

Bowman, E. & Fraser, S. (Eds.) (2011). Infants of diabetic mothers. *Neonatal Handbook*. The Royal Children's Hospital Melbourne. Updated January 10, 2011. Available at www.rch.org.au/nets/handbook/index.cfm?doc_id=889

Moore, T.R. et al. (2011). Diabetes mellitus and pregnancy. *Medscape*, updated August 2011. Available at <http://emedicine.medscape.com/article/127547-overview>

Osgood, N.D., Dyck, R.F. & Grassmann, W.K. (2011). The inter and intra generational impact of gestational diabetes on the epidemic of type 2 diabetes. *American Journal of Public Health* 2011. 101(1), 173-179.

Tobias, D.K. et al. (2011). Increased risk of hypertension after gestational diabetes mellitus: Findings from a large prospective cohort study. *Diabetes Care*. Jul 2011, 34(7), 1582-4.

United Nations. (2011). Adopted draft political declaration of the High-level Meeting of the General Assembly on the Prevention and Control of NCDs. Available at http://www.un.org/ga/search/view_doc.asp?symbol=A%2F66%2FL.1&Lang=E

The World Bank. (2011). *The growing danger of non-communicable diseases: Acting now to reverse course*. Washington, D.C.: Health, Nutrition and Population, Human Development Network, The World Bank. 24p. Available at www-wds.worldbank.org/external/default/WDSPContentServer/WDSP/IB/2011/11/30/000386194_20111130023857/Rendered/PDF/657850WP0Box360C00WBDeepeningCrisis.pdf

World Health Organization. (2011) *Prevention and control of noncommunicable diseases: Implementation of the global strategy for the prevention and control of noncommunicable diseases and the action plan*. Available at http://apps.who.int/gb/ebwha/pdf_files/EB130/B130_7-en.pdf

World Health Organization. (2011). *Prevention and control of noncommunicable diseases: Outcomes of the High-level Meeting of the General Assembly on the Prevention and Control of Noncommunicable Diseases and the First Global Ministerial Conference on Healthy Lifestyles and NCD Control*. Available at http://apps.who.int/gb/ebwha/pdf_files/EB130/B130_6-en.pdf

ARROW. (2010). *Regional overview of MDG 5 in Asia: Progress, gaps and challenges 2000-2010*. Kuala Lumpur, Malaysia: Asian-Pacific Resource and Research Centre for Women, ARROW. 8p. Available at www.arrow.org.my/publications/MDG5RegionalBrief.pdf

McLean, G.D. (2010). An historical overview of the first two decades of striving towards safe motherhood. In *Sexual and Reproductive Healthcare*, 1, 7–14.

Roglic, G. & Unwin, N. (2010). Mortality attributable to diabetes: Estimates for the year 2010. *Diabetes Research and Clinical Practice* 2010, 87(1), 15-9.

United Nations Secretary-General. (2010). *Global Strategy for Women's and Children's Health*. New York: The Partnership for Maternal, Newborn and Child Health. 20p. Available at www.un.org/sg/hf/Global_StrategyEN.pdf

Wylie, Kevan et al. (2010). Androgens, health and sexuality in women and men. *Maturitas*, 67, 275–289.

International Diabetes Federation. (2009). *Diabetes Atlas, 4th edn*. Brussels: IDF. Available at www.idf.org/diabetesatlas

WEBLINKS

ARROW's Sexual and Reproductive Health and Rights (SRHR) Database of Indicators www.srhrdatabase.org

This comprehensive database, an outcome of ICPD+15 monitoring project - a collaborative monitoring partnership with 22 partners (women's NGOs and research and academic organisations), across 12 countries in the Asian region - provides data and analysis on 79 rights-based indicators to compare the status of sexual and reproductive health and rights in the 12 countries. The current ICPD+20 monitoring project has expanded the collaboration with 4 more partners (women's networks, NGOs and research organisations), and the database now extends to 50 countries in 5 regions in the Global South (Africa, Asia-Pacific, Eastern Europe, Latin America and the Caribbean, and the Middle East and North America).

International Diabetes Federation www.idf.org/

The International Diabetes Federation's (IDF) website is a useful resource for data and information on diabetes risks, prevalence, prevention, care and management. Evidence-based global reports such as diabetes atlases, clinical guidelines, position papers, research, educational and advocacy material, videos can be found on the site. Updates on global commitments, initiatives, conferences, and campaigns on diabetes, in addition to IDF programmes and activities can also be found here.

The NCD Alliance www.ncdalliance.org/

The website is an advocacy and information sharing platform for the alliance of four international federations namely the International Diabetes Federation, The World Heart Federation, Union for International Cancer Control, and the International Union Against Tuberculosis and Lung Disease.

The Partnership for Maternal, Newborn, and Child Health www.who.int/pmnch/en/

This site provides updates, strategies, and resources related to maternal, newborn, and child health.

The World Diabetes Foundation www.worlddiabetesfoundation.org/

The website provides details on various initiatives on diabetes prevention, care and reduction around the world. Specifically, pages are dedicated to information on gestational diabetes, diabetes and tuberculosis, and diabetes and the foot. An interesting feature of the website is the interactive clinic model – an educational toolkit for the healthcare professional – to promote diabetes care.

World Health Organization www.who.int/reproductivehealth/en/ www.who.int/nmh/en/ www.who.int/topics/chronic_diseases/en/ www.who.int/ncd_surveillance/en/ www.who.int/diabetes/en/index.html

These various WHO programme and project sites provide data, guidelines, technical publications and other resources on sexual and reproductive health, noncommunicable diseases, NCD surveillance, and diabetes.

ARROW Publications

ARROWs For Change. Volumes 1-17. ARROW's flagship, peer-reviewed thematic bulletin is produced twice a year in English, and translated into selected strategic Asia-Pacific languages several times a year with the objective of contributing a Southern/Asia-Pacific, rights-based and women-centred analyses and perspectives to global discourses on emerging and persistent issues related to health, sexuality and rights. Subscription rate per annum US\$10 (Individuals) & US\$15 (Organisations).

Racherla, S. J. (Ed.) (2011). *Reclaiming & redefining rights - thematic studies series 4: Maternal mortality morbidity in Asia*. Kuala Lumpur: ARROW. 204p. US\$10.

Thanenthiran, S. (Ed.) (2011). *Reclaiming & redefining rights - thematic studies series 3: Reproductive autonomy and rights in Asia*. Kuala Lumpur: ARROW. 156p. US\$10.

Ravindran, T.K.S. (2011). *Reclaiming & redefining rights - thematic studies series 2: Pathways to universal access to reproductive health care in Asia*. Kuala Lumpur: ARROW. 92p. US\$10.

Thanenthiran, S. (Ed.) (2011). *Reclaiming & redefining rights - thematic studies series 1: Sexuality and rights in Asia*. Kuala Lumpur: ARROW. 104p. US\$10.

Reproductive Health Matters (RHM) & ARROW. (2011). *Repolicising sexual and reproductive health and rights: Report of a Global Meeting, Langkawi, Malaysia, 3-6 August 2010*. 74p.

ARROW. (2010). *ARROW Publications 1994-2010*. [DVD] Kuala Lumpur: ARROW.

ARROW. (2010). *Understanding the critical linkages between gender-based violence and sexual and reproductive health and rights: Fulfilling commitments towards MDG+15*. Kuala Lumpur: ARROW. 12p.

ARROW & WHRAP. (2010). *Making a difference: Improving women's sexual & reproductive health & rights in South Asia*. Kuala Lumpur: ARROW. 126p.

ARROW. (2010). *Regional overview—MDG5 in Asia: Progress, gaps and challenges 2000-2010*. Kuala Lumpur: ARROW. 8p.

ARROW. (2010). *Briefing paper: The women and health section of the Beijing Platform for Action*. Kuala Lumpur: ARROW. 4p.

Thanenthiran, S. & Racherla, S. J. (2009). *Reclaiming & redefining rights: ICPD+15 status of sexual and reproductive health and rights in Asia*. Kuala Lumpur: ARROW. 162p. US\$10.

ARROW. (2008). *Advocating accountability: Status report on maternal health and young people's SRHR in South Asia*. Kuala Lumpur: ARROW. 140p. US\$10.

ARROW. (2008). *Surfacing: Selected papers on religious fundamentalisms and their impact on women's sexual and reproductive health and rights*. Kuala Lumpur: ARROW. 76p. US\$5.

ARROW. (2007). *Rights and realities: Monitoring reports on the status of Indonesian women's sexual and reproductive health and rights; findings from the Indonesian Reproductive Health and Rights Monitoring & Advocacy (IRRMA) Project*. Kuala Lumpur: ARROW. 216p. US\$10.

ARROW & Center for Reproductive Rights (CRR). (2005). *Women of the world: Laws and policies affecting their reproductive lives, East and Southeast Asia*. Kuala Lumpur: ARROW. 235p. US\$10.

ARROW. (2003). *Access to quality gender-sensitive health services: Women-centred action research*. Kuala Lumpur: ARROW. 147p. US\$10.

ARROW. (2001). *Women's health needs and rights in Southeast Asia: A Beijing monitoring report*. Kuala Lumpur: ARROW. 39p. US\$10.

Abdullah, R. (2000). *A framework of indicators for action on women's health needs and rights after Beijing*. Kuala Lumpur: ARROW. 30p. US\$10.

ARROW. (2000). *In dialogue for women's health rights: Report of the Southeast Asian Regional GO-NGO policy dialogue on monitoring and implementation of the Beijing Platform for Action, 1-4 June 1998, Kuala Lumpur, Malaysia*. Kuala Lumpur: ARROW. 65p. US\$10.

These publications are available in electronic formats at www.arrow.org.my and in a DVD compilation. Payments for print copies are accepted in bank draft form. Please add US\$3.00 for postal charge. For more details, email arrow@arrow.org.my



ASIAN-PACIFIC RESOURCE & RESEARCH CENTRE FOR WOMEN (ARROW)

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FACEBOOK: THE ASIAN-PACIFIC RESOURCE & RESEARCH CENTRE FOR WOMEN



The Asian-Pacific Resource and Research Centre for Women (ARROW) is a regional, non-profit organisation with a consultative status with the Economic and Social Council of the United Nations. Based in Kuala Lumpur, Malaysia, ARROW has been working since 1993 to advocate and protect women's health needs and rights, particularly in the areas of women's sexuality and reproductive health, and to enhance civil society capacities to hold governments accountable to their international commitments related to the same. ARROW's work spans information and communications, evidence generation, capacity building, regional monitoring of progress, partnership building for advocacy, engagement at international and regional fora, and contributing towards enhancing the organisational strength of both ARROW and partners. We work with more than 30 national partners in 17 countries across the Asia-Pacific region, with regional partners from Africa, Middle East, Eastern Europe, and Latin America and the Caribbean, and with some international organisations from the global North.

THE WORLD DIABETES FOUNDATION

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FACEBOOK: WORLD DIABETES FOUNDATION



WORLD **DIABETES** FOUNDATION

World Diabetes Foundation (WDF) is an independent trust fund established in 2002 by Novo Nordisk A/S (NN). Based in Copenhagen, Denmark the Foundation is dedicated to supporting prevention and treatment of diabetes in developing countries through funding of sustainable projects. In line with its mission and strategy WDF's work encompasses: advocacy, capacity building of both patients and healthcare professionals, prevention, early detection, treatment and monitoring of diabetes. It focuses on the "neglected areas" of diabetes care, which are important not only from a health but socio-economic standpoint, namely prevention of needless foot amputations, blindness as a consequence of diabetes, mothers and diabetes, and the recent scientific link between diabetes and tuberculosis. In addition, it creates partnerships and acts as a catalyst to help others do more and strives to educate and advocate globally in an effort to create awareness, care, and relief to those impacted by diabetes. To date, close to 300 projects in 100 countries have benefited from WDF support.

Diabetes: A Missing Link to Achieving Sexual and Reproductive Health in the Asia-Pacific Region is a compilation of papers presented at an ARROW-WDF symposium held at the 6th Asia Pacific Conference on Reproductive and Sexual Health and Rights (APCRSHR). It highlights the critical linkage between diabetes and women's sexual and reproductive health. The three papers by Dr. Anil Kapur, Dr. Jessica Ona-Cruz, and Dr. Hoang Tu Anh aim to provide an overview of the scale and burden of the disease in the Asia-Pacific region, an understanding of the negative impact of diabetes on pregnancy and perinatal outcomes, on the health of women and future generations, and on the sexuality and sexual health of men and women. Dr. Narimah Awini, in the concluding chapter, synthesizes the key points presented in the three papers, makes strategic recommendations for action, and presents advocacy opportunities for reducing deaths and disabilities and improving the health of women and future generations. Definitions of terms are provided to enhance understanding of issues, in addition to statistical data and resources. We hope this publication will advance the understanding of the issues and that the recommendations to the policy makers, programme implementers, medical practitioners, donors and other stakeholders will be translated into concrete action.



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