

PCOS-Epidemic in India: An Emerging Public Health Challenge

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International Conf PCOS Society India with
AE-PCOS Society USA

PCOS-Epidemic in India: An Emerging Public Health Challenge

- Is PCOS-Epidemic Real?
- Is PCOS a relatively neglected NCD?
- Why PCOS is emerging as a Public Health Challenge?
- How much is the Socio-Economic Burden?
- India Specific suggestions for concerted actions



World Health Organization

World Health Organization (WHO)

PCOS affected **116 million** women worldwide in 2012 (3.4% of women)

Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990-2010: **a systematic analysis for the Global Burden of Disease Study 2010.**

Vos T et al

Lancet 2012;380(9859):2163-96.

PCOS-Epidemic: How Big Is the burden?

Prevalence of polycystic ovary syndrome using different diagnostic criteria

Source	Population	NIH/NICHD	Rotterdam	Androgen excess and PCOS society
March et al	728 Australian	8.7%	17.8%	12.0%
Mehrabian et al	820 Iranian	7%	15.2%	7.92%
Asuncion M	154 Spain	6.5%	-	-
Yildiz et al	392 Turkish	7.1%	19.9%	15.3%
Beena Joshi,et al	600 Indian (Mumbai)	-	22.5 %	10%
Nidhi R et al	460 Indian (Andhra Pradesh)	-	9.3%	-
Chhabra S et al	1182 Indian Rural (Sevagram)	-	8.4%	-
Balaji S et al	163 Indian(Vellore) Urban 63,Rural 63 Age 12-19yrs	-	18% (U 25%, R 11%)	-

1.4 million Canadian women may be afflicted with PCOS

J Obstet Gynaecol Can. 2008 August ; 30(8): 671–679.



Beena Joshi,et al

Systematic multistage random sampling method

Sampled census block of **Mumbai, Maharashtra**

Attained menarche more than 2 years before the study,

Indian J Endocrinol Metab. 2014; 18: 317–324.

Beena Joshi,et al	600 (Mumbai)	22.5 %
Nidhi R et al	460 (Andhra Pradesh)	9.3%
Chhabra S et al	1182 Rural (Sevagram)	8.4%
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Nidhi R et al

15 to 18 years from a residential college

Andhra Pradesh, South India

J Pediatr Adolesc Gynecol 2011;24:223-7.

Chhabra S et al

Hospital Based Study Gynaecological Outpatient,

Rural Population, **Sevagram, Maharashtra**, Age group 15-34 y

J Obstet Gynec 2010;30:41-5

Balaji S et al

Outpatient Department of Balaji Hospital._ **Vellore district, Tamil Nadu**

Convenient based sampling **Rural, Urban** population

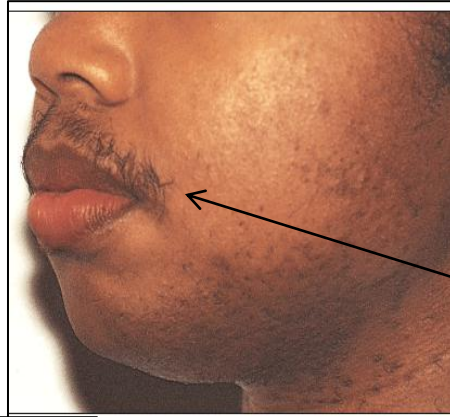
12 and 19 years menarche 2 years before their existing complaint of menstrual disorder.

Biomed Res Int. 2015; 2015: 158951.



PCOS

Who is treating this heterogeneous disorder ?



Dermatologists



LightSheer Duet laser

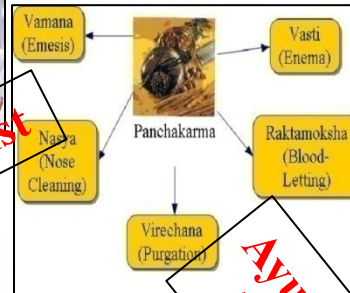
Cosmetologists



Medical Endocrinologist



Nutritionist



Ayurveda Acharya



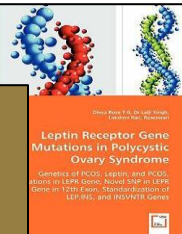
Accupuncture



Homeopathy



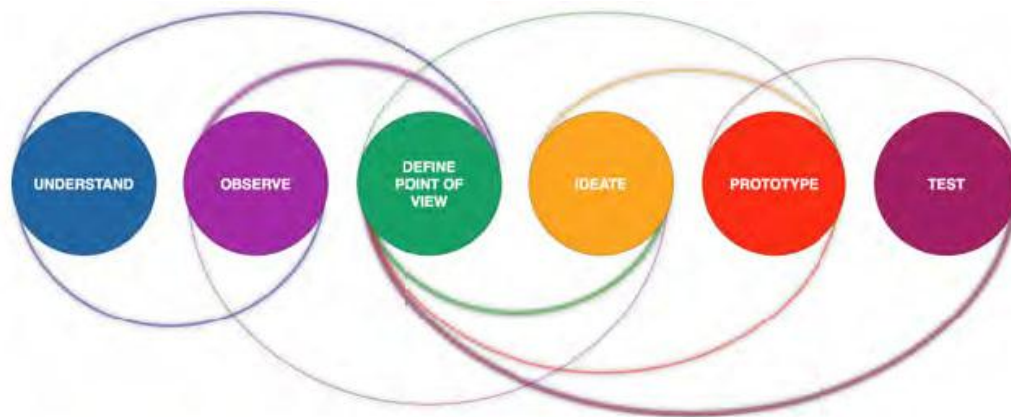
Radiologist



Molecular Endocrinologist/ Geneticist

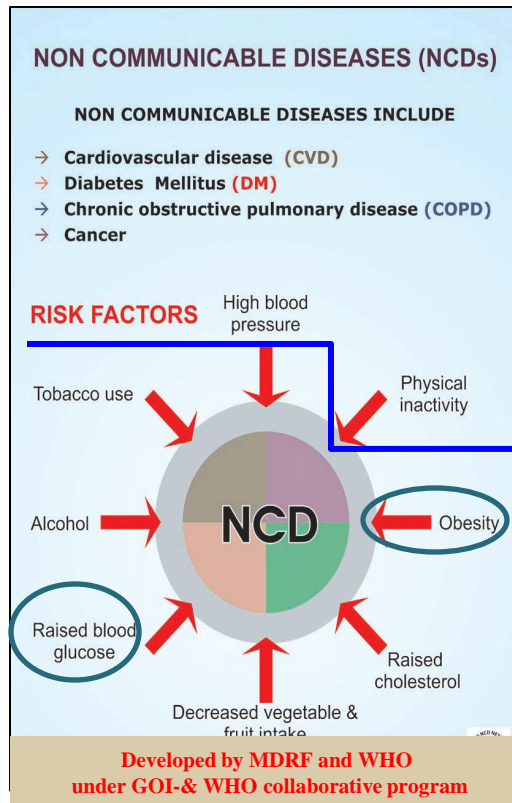
Women may present with a variety of symptoms to **different healthcare providers** and may be **treated** only for the presenting symptoms **without evaluation of the syndrome and its associated morbidities.**

multidisciplinary healthcare teams



Dokras A and Witchel SE
Are young adult women with polycystic ovary syndrome
slipping through the healthcare cracks?
JCEM 2014;99:1583-5

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PCOS is a relatively a neglected Non-Communicable Disease (NCD)

- Novel CVD risk factors by sex (PCOS)
- Long-term Hormonal Use from Early Age

Key Non- Communicable Diseases

1. Cancer
2. Cardio-Vascular Disease
3. Diabetes
4. Chronic kidney Disease

Strategies and methods to study female-specific cardiovascular health and disease:
a guide for clinical scientists

Ouyang et al. *Biology of Sex Differences* (2016) 7:19

Sleep Debt Epidemic of 21st Century

In a survey of sleep-patterns during **Steps to Swasthya program for PCOS** nearly 40% of them prefer to study for 4-5 hours at night as their home environment is more quiet and conducive for study in those hours. The others may simply engage themselves in watching TV, play video-games or are busy chatting with friends during wee hours of night.

Research on sleep debt**chronic loss of sleep causes overeating, obesity, type 2 diabetes and metabolic perturbations.** Extension of sleep hours, use of CPAP for sleep apnea may prevent or delay development of diabetes and co-morbidities.

“Yoga Nidra”, in particular, could rescue those sleep-deprived from ill effects of sleep-debt on their health. !!..... Yoga Nidra, guided meditation and relaxation, there is scant bio-medical research done in this area.

Vaidya RA
Sleep Debt of 21st Century
The Indian Practitioner 2016 June

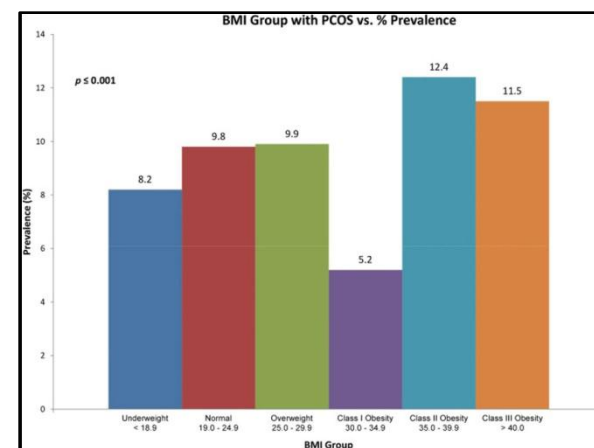
Spiegel K, Leproult R, Cauter EV
Impact of sleep debt on metabolic and endocrine function
Lancet 1999; 354:1435-1439

Prevalence of Obesity in PCOS

Author	Country	Over Weight	Obese
		%	%
Aziz et al	USA	19.4	58.2
Dabadghao	Australia	OW +OB	86.8
Carmina et al	Italy	41.1	37.8
Vaidya et al	India	60.9	28.4
Joshi et al	India	OW+OB	29%

Obesity:

likely not a cause of PCOS
It exacerbates many aspects
of the phenotype,

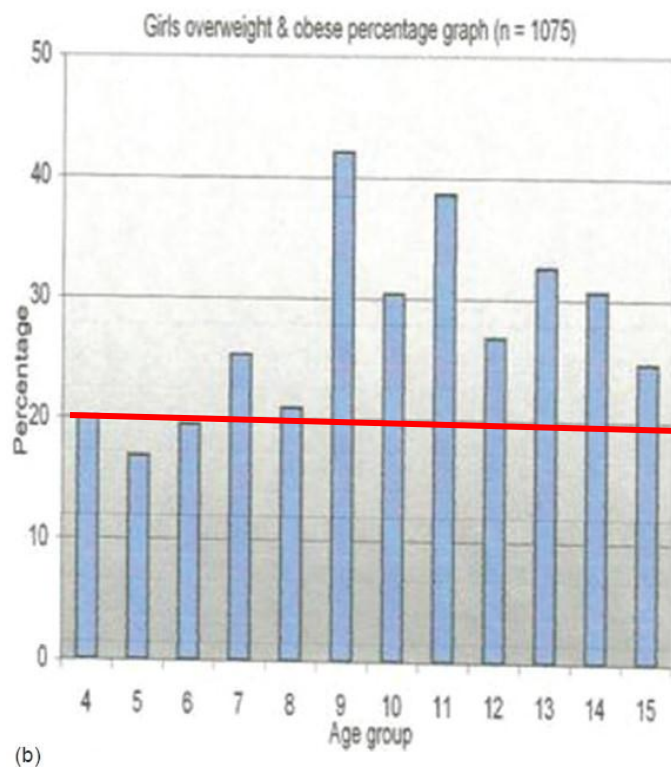


Legro RS

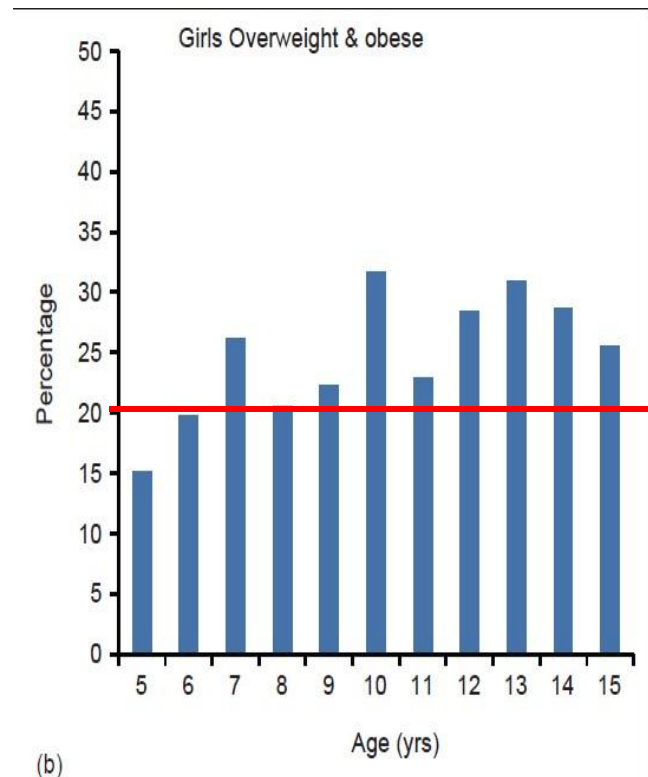
Obesity and PCOS:

Semin Reprod Med 2012;30:490-506

A cross-sectional study of childhood and adolescent obesity in affluent school children from western suburb of Mumbai 2001-2002 and 2013-2014



girls (n=333/1075) in stage 1 of the study



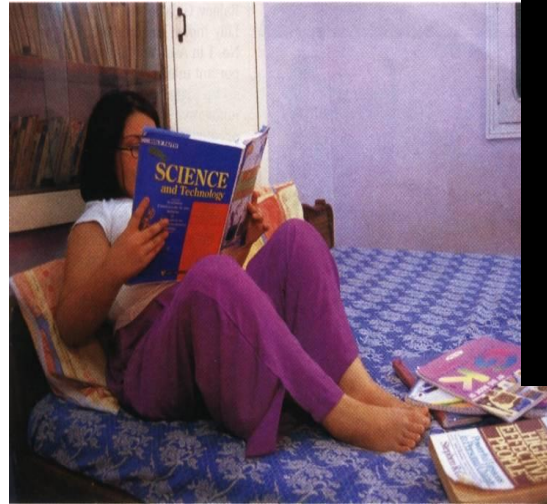
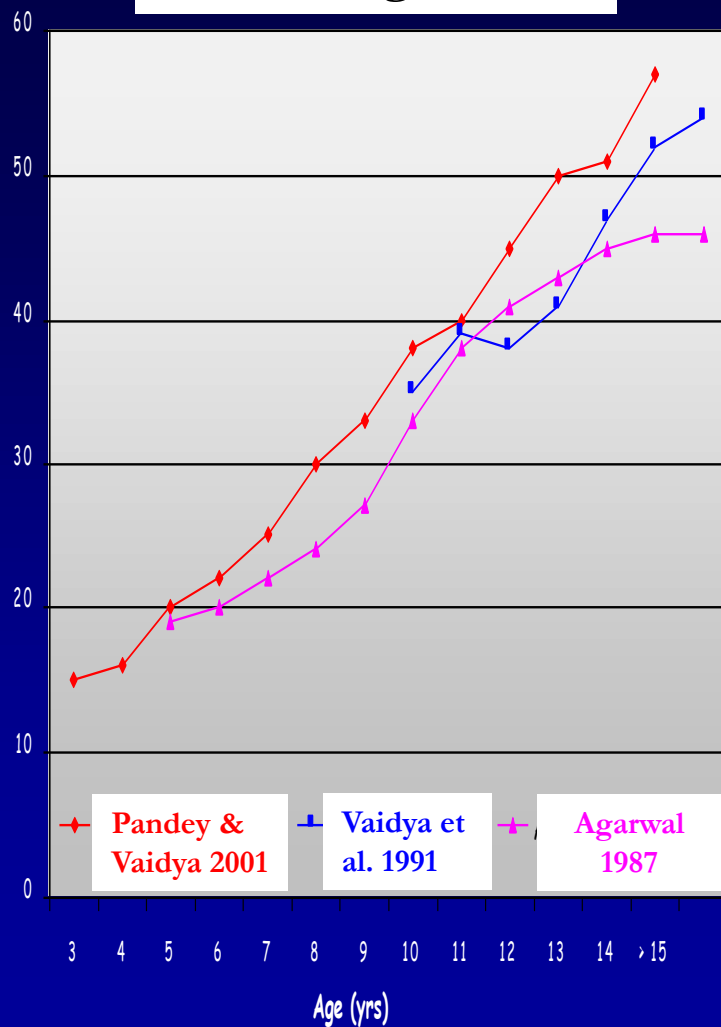
girls (n=248/989) in stage 2

Pandey SN...Vaidya RA et al. Obes Metab Res 2014;1:7-13

Obesity (? Diabetes) in Children & Adolescents

Weight (kg)

Mean Weight Girls



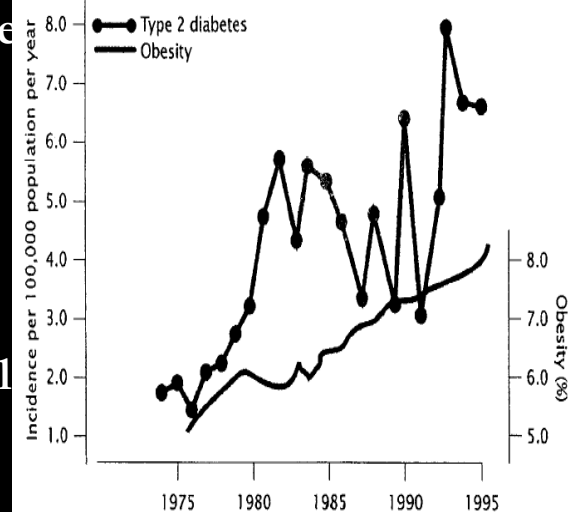
"I miss sweets and chocolates

but I am used to it now."

– Kalpana Sharma, 10yrs

India Today. Oct 6; 2003; 21

Parallel rise in incidence of Type 2 diabetes in children & levels of obesity from 1975-1995 among Japanese school children



Alberti G et al, Diabetes Care 2004;27:1798-11

Insulin Resistance in Adolescent PCOS (N=79)

Adolescent PCOS BMI	IFG/IGT	Type 2 DM	Insulin Resistance FG/FI<4.5
Lean N=39	N=2	-	10/39 (25.6 %)
Over Weight N=9	-	-	4/9 (44.4%)
Obese N=31	-	-	22/31 (71%)
Total N=79			36/79 (45..5%)

Insulin Resistance in Adult PCOS (N=128)

Group Adult PCOS BMI	IFG/IGT	Type 2 DM	Insulin Resistance FG/FI<4.5
Lean N=57	-	-	15/57 (26.3%)
Over Weight N=18	N=1	-	4/18 (22.2%)
Obese N=53	N=2	N=1	27/53 (50.9%)
Total N=128	Rege NR, Gogte J, Vaidya AB, Vaidya RA (unpublished data)		46/128 (35.9%)

Insulin and Adipokines in PCOS (N=35)

Group	Insulin AUC	Leptin (ng/ml)	Adiponectin (ug/ml)	TNF-alfa (pg/ml)	Hs CRP (mg/L)
Obese IR (n=22)	254.1 ± 96.4	85.9± 42.7	4.3 ± 1.7	40.8± 28.1	9.9 ± 6.4
Obese non-IR (n=7)	99.5 ± 42.4	67.1 ± 24.8	5.6 ± 1.3	16.9 ± 12.7	8.6 ± 4.1
Non Obese IR (n=6)	276.4 ± 115.3	50.9 ± 23.6	5.9 ± 2.3	26.7± 24.5	7.5± 7.8

Control (n=22)	HS-CRP (mg/dl)	Adiponectin	WBC (c.mm)	FG/FI	Ins.Fasting (uIU/ml)	Ins.2 hr PG (uIU/ml)
Mean	Range < 1.0 – 2.3	10.24	6825.00	12.6	6.60	44.47
STD (±)		2.32	2292.56	6.21	2.62	25.58

Vaidya RA, Pandey SN, Vaidya ADB
PCOS: Is it a chronic Inflammatory Disease?
ECAB Clinical Update Obstetrics & Gynecology .2008;42:73

Mertia P, Agashe S, Rege N, Vaidya R
Polycystic Ovary and Leucocytosis
The Indian Practitioner 2014

Economic burden to a woman affected with PCOS

India, being the diabetic capital of the world, has close relation to PCOS—MS continuum and policymakers should get alarmed to the existence of this metabolic malady and prevent the birth of the consequent disorders.

M. Ashraf Ganie and Sanjay Kalra

Polycystic ovary syndrome – A metabolic malady, the mother of all lifestyle disorders in women – **Can Indian health budget tackle it in future?**

Indian J Endocrinol Metab. 2011 Oct-Dec; 15(4): 239–241.

Economic burden to a woman affected with PCOS

Metabolic & CVD Per session

₹ 4000 - 50000

The
PCOS
Protection Plan

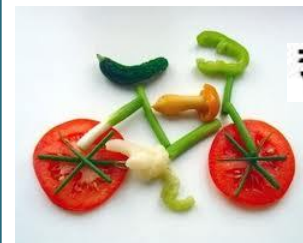
How to Cut Your Increased Risk of
Diabetes, Heart Disease, Obesity,
and High Blood Pressure

* Metabolic Health Specialist



Lifestyle MRx

₹ 20- 50000/ yr



Cosmetologic therapies

Per session
₹ 7000



Initial evaluation

₹ 4000 - 5000



Menstrual disorders, infertility Per month

₹ 5000 - 1 L (IVF)



India Specific suggestions for concerted actions

**Four-tier Health Care for PCOS with
feed-back loops between tiers and strong net-working
(Federal Policy-State Resource)**

PCOS Advanced Centers:

Strategy, Research, Advanced Education, Models of Services

PG Institutes;

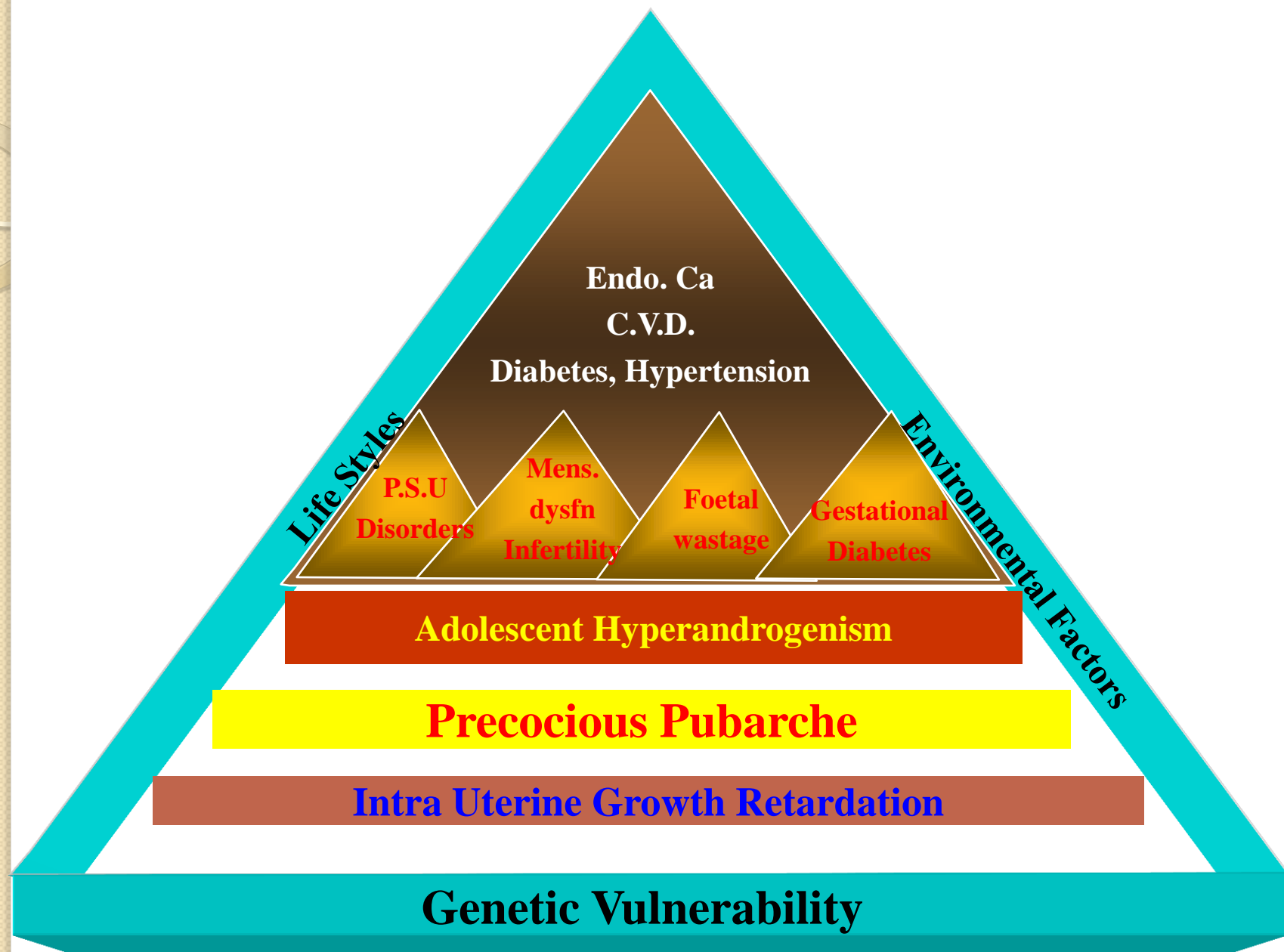
Modules of Multispecialty Clinics, Training Programs

District Hospitals/Private Sectors:

Awareness Programs, Camps, Bridge Models of Care

Primary Health Care Units:

Awareness and Referral Net-work, Community Involvement



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Prajakta Paradkar

Zankruti Parikh

Mona Shah

NIRRH - ICMR

Sanjay Chauhan

Beena Joshi

Srbani Mukharji

Anushree

Smita Mahale

Multidisciplinary Opinion

On challenges in Medical

Management of PCOS

Gulrez Tyebkhan

Priti Vyas

Reena Wani

Beena Joshi

Srabani Mukherji

Sangeeta Velskar

Jaya Gogate

Rishma Dhilon Pai

Roda Dalal

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