Hormonal contraception and acne

Øjvind Lidegaard

Dansk Dermatologisk Selskab 15.1.2014

Gynaecological Clinic, Rigshospitalet
University of Copenhagen

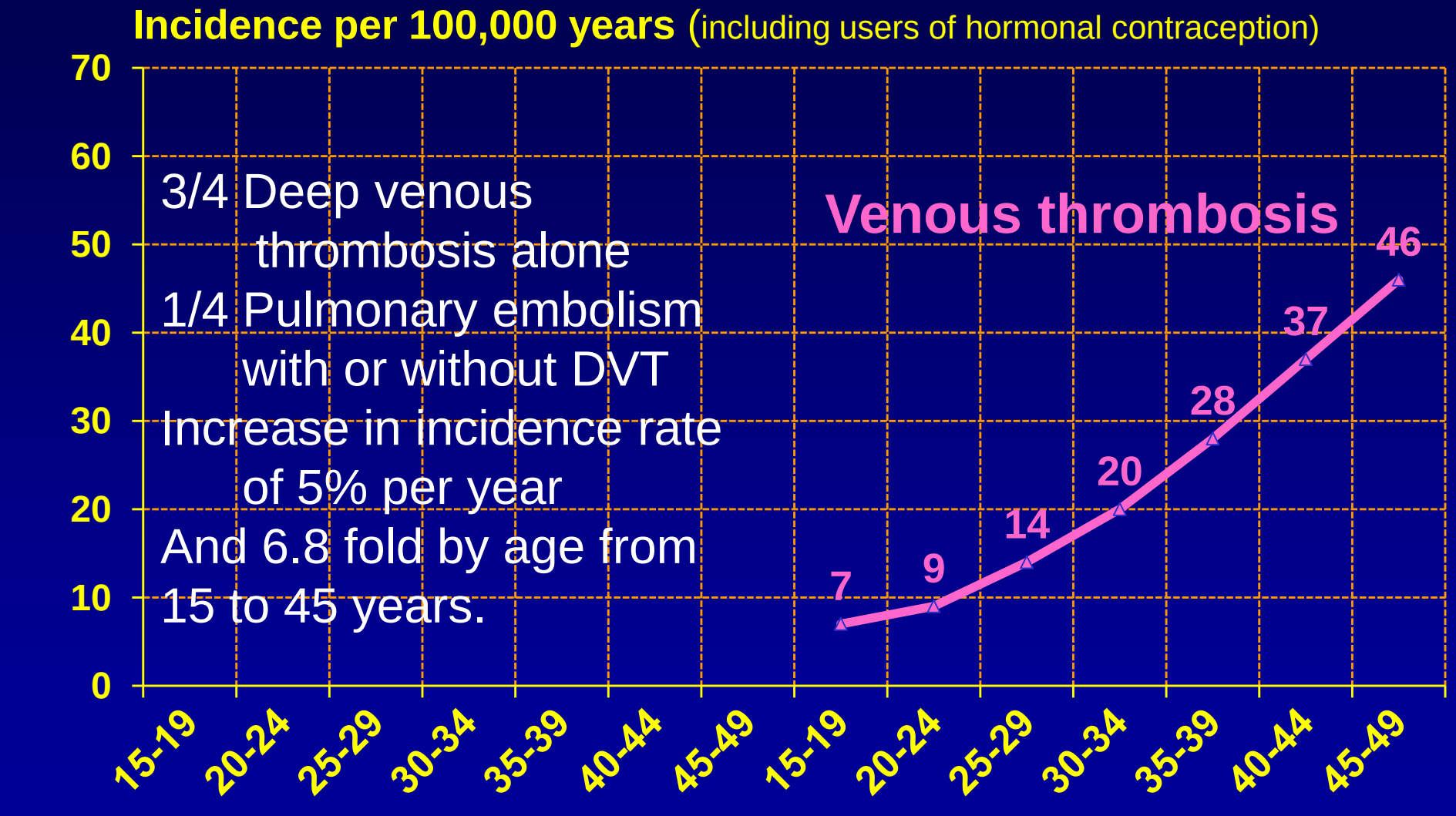
OC generations according to oestrogen dose and progestogen type

Progestogen generation

	1 Estrans NETA	2 Levonor-gestrel	"2" Norges-timate	3 Deso-gestrel	3 Gesto-dene	4 Dros-pirenone
50^{high}	High dose		EVRA	-	-	-
30-40^{mid}	1st	+ 2nd +		NuvaRing +	+	+ 4th
20^{low}	-	-	-	3rd +	+	+
E2/DNG	+	-	-	-	-	
POP	+	+		+		

Venous thrombosis in DK 2001-2009*

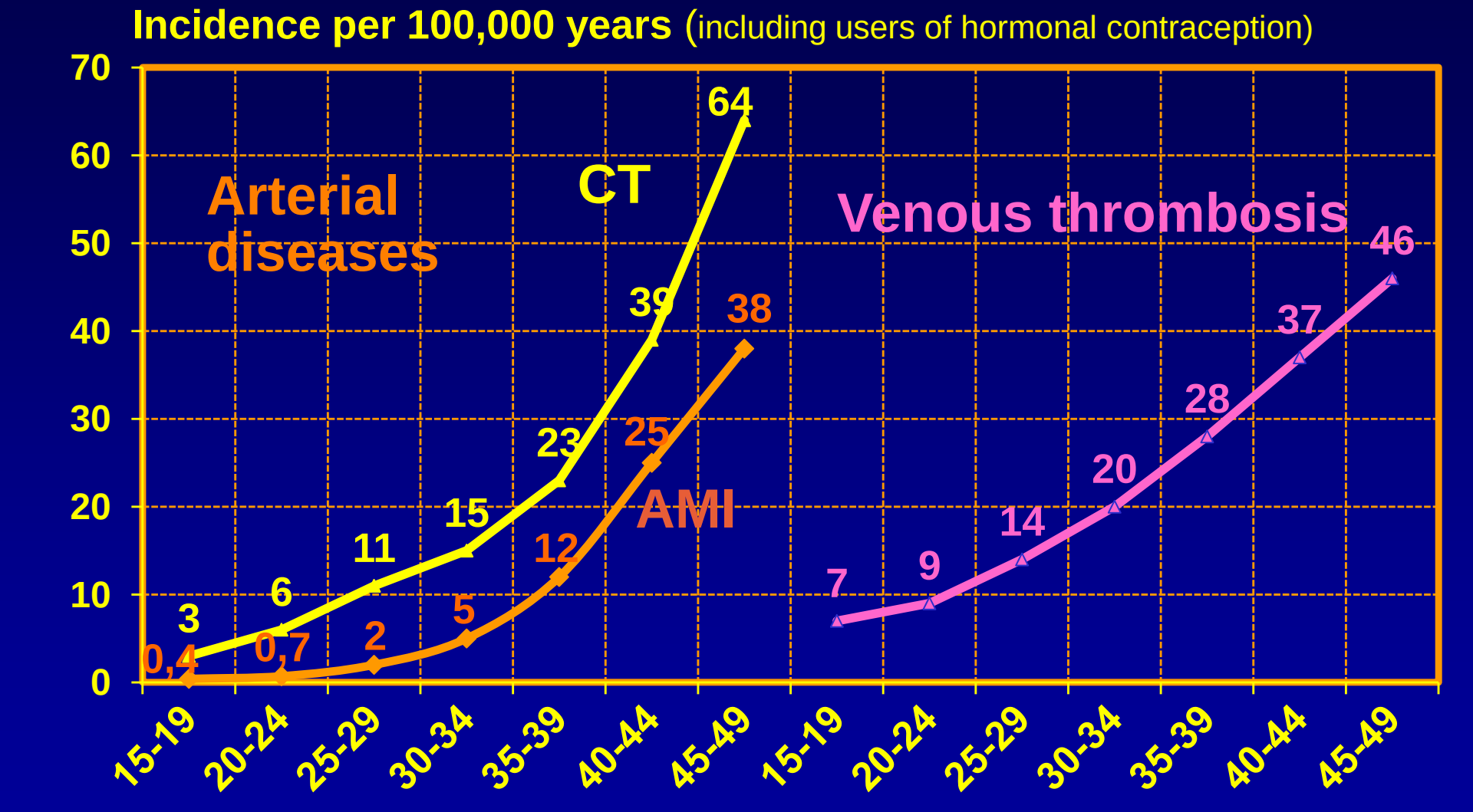
Pregnant and puerperal women excluded



Lidegaard et al BMJ 2011

CT, AMI and VT in DK 2001-2009*

Pregnant and puerperal women excluded



Lidegaard et al NEJM 2012 and BMJ 2011

VT: Acquired risk factors

	Prevalence	RR
Age ≥30 vs <30	50%	2.5
Pregnancy	4%	8
Adiposity (BMI>25)	30%	2
Varicose veins	8%	2
Immobilisation/trauma	?	2-10
Oral contraceptives	30%	3-6
PCOS	10%	2
Medical diseases	5%?	2-5

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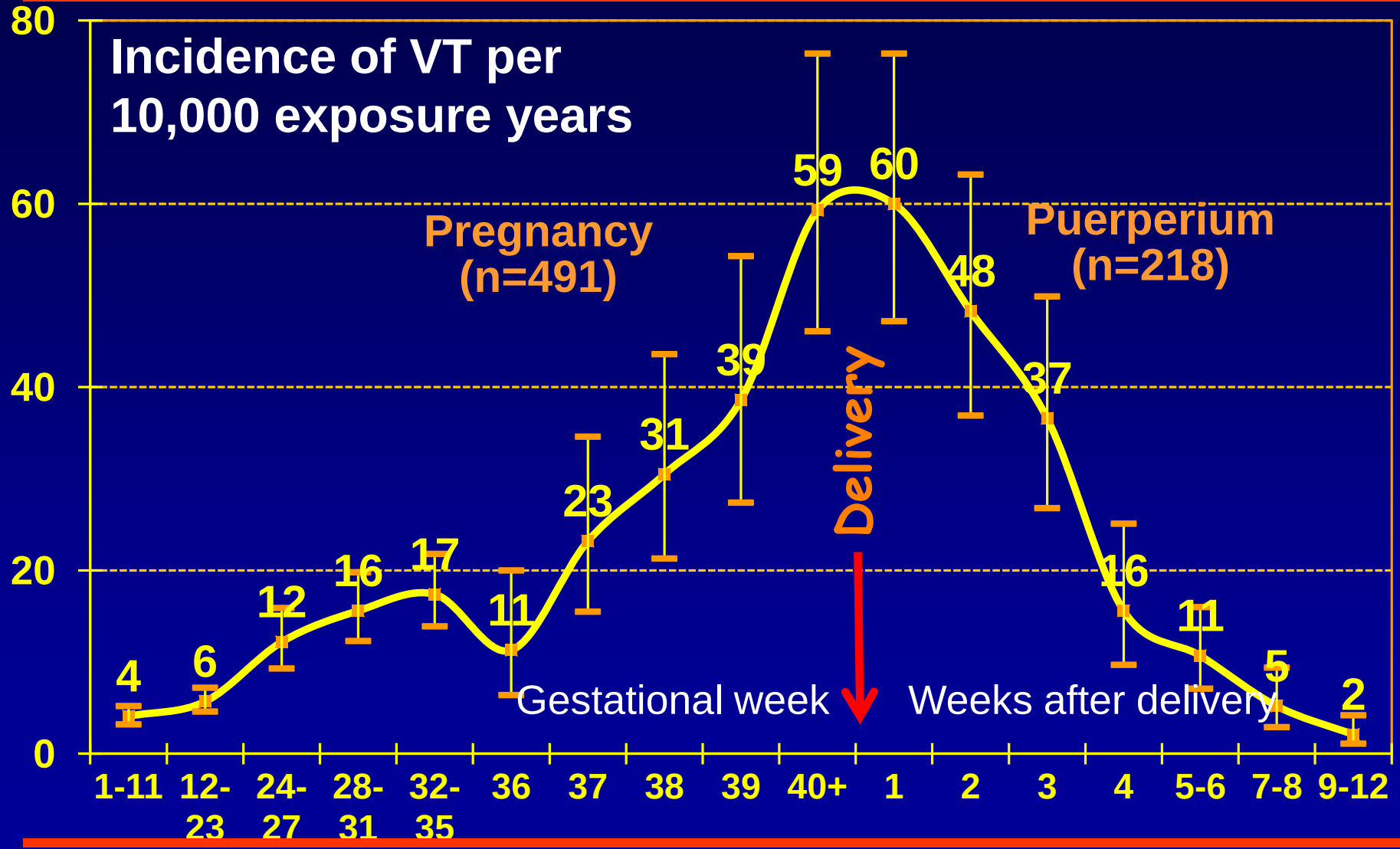
Immobilisation/trauma	?	2-10
Oral contraceptives	30%	3-6
PCOS	**10%**	**2**
Medical diseases	5%?	2-5

Venous thrombosis in pregnant and puerperal women, DK 1995-2005. N=709



Virkus et al. Thromb Haemost 2011; 106: 304-9

Li/12

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OC and VT: Methods

National Registry of Patients (>1977)

VT diagnoses,

Previous CaVD/canc.

Pregnancies, surgery

National Registry of Medicinal products (>1995): OC use

Medication against

BP↑, DM, Hyperchol.

1995 → 2005

Cause of Deaths Registry (>1977)

Lethal VT

Statistics of Denmark

PIN-codes, education

vital status, emigration

Lidegaard et al. BMJ 2009

BMJ

Hormonal contraception and risk of venous thromboembolism: national follow-up study

Øjvind Lidegaard, professor,[1] Ellen Løkkegaard, consultant,[2] Anne Louise Svendsen, statistician,[3] Carsten Agger, data manager[4]

[1]Gynaecological Clinic, Rigshospitalet, Copenhagen University, DK-2100 Copenhagen, Denmark

ABSTRACT

Objective To assess the risk of venous thrombosis in current users of different types of hormonal

BMJ

RESEARCH

The venous thrombotic risk of oral contraceptives, effects of oestrogen dose and progestogen type: results of the MEGA case-control study

A van Hylckama Vlieg, research fellow,[1] Helmerhorst, professor of clinical epidemiology of fertility,[1,2] J P Vandenbroucke, professor of clinical epidemiology,[1] C J M Doggen, research fellow,[1] F R Rosendaal, professor of clinical epidemiology, head of department[1,3,4]

risk of venous thrombosis than oral contraceptives with levonorgestrel. Progestogen only pills and hormone releasing intrauterine devices were not associated with

VT and drospirenone

	VT no	Risk /10,000	Rate ratio DRSP/2nd gen
Dinger[07]	118	9.1	1.0 (0.6-1.8) 4th/2nd
Vlieg[09]	1,524	na	1.7 (0.7-3.9) 4th/2nd
Lidegaard[09]	4.213	7.8	1.6 (1.3-2.1) 4th/2nd

Lidegaard et al. BMJ 2009

Critique

REVIEW

Risk of venous thromboembolism among users of oral contraceptives: a review of two recently published studies

Samuel Shapiro, Jürgen Dinger

Abstract

Background Two recent studies, a cohort study from Denmark, and a case-control study from The Netherlands, have reported increased risks of venous thromboembolism (VTE) among users of oral contraceptives (OCs) containing desogestrel, gestodene, drospirenone and cyproterone, relative to the use of levonorgestrel.

Critique In the Danish study the comparisons were not valid. (1) VTE risk is highest soon after commencement of OC use, and duration of use was underestimated for levonorgestrel users, but not for drospirenone users; for the remaining compounds duration was only slightly underestimated. The underestimation for levonorgestrel resulted in systematic overestimation of the relative risks for the compared OCs. (2) Duration was also incorrectly estimated: only the duration of current use, *not duration of all episodes of use* was relevant to VTE risk. (3) Confounding was not adequately controlled.

In The Netherlands study the comparisons were not valid. (1) The relative risk for drospirenone versus levonorgestrel was not statistically significant. (2) Extensive publicity had been given to the risk of VTE among users of desogestrel, gestodene, drospirenone and cyproterone: information bias and detection bias were therefore likely. (3) Inadequate allowance was made for duration of use. (4) The combination of two different control groups, both of them likely to have been biased, into a single category was not valid.

Conclusion The best evidence continues to suggest that the increased risk of VTE in OC users is a class effect, dependent on the estrogen dose and duration of use, and independent of the progestogen used.

Keywords combined oral contraceptives, progestogen, risk assessment, venous thromboembolism

J Fam Plann Reprod Health Care 2010; **36**(1): 33–38
(Accepted 25 November 2009)

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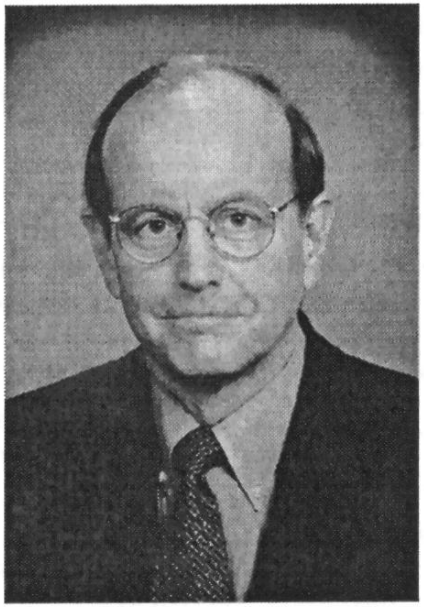
An Editor

Epidemiologic Research Using Administrative Databases

Garbage In, Garbage Out



David A. Grimes, MD

Administrative databases stem from claims made for services by health care providers and institutions.[1] Simply put, they are billing systems. These databases were created for reasons other than epidemiologic research–a key limitation. Data fields commonly include only basic demographic information, drug dispensing, provider visits, and hospitalization. Examples of administrative databases often used by researchers include Medicare, Medicaid, and those of health maintenance organizations such as Kaiser Permanente.

Vital records, such as birth certificates, represent another administrative database commonly used for epidemiologic research.[2,3] Again, these data are collected for civil and legal purposes, not for research.

Research using administrative databases has important strengths and weaknesses. Sample sizes are often large, which provide power to find differences. Those enrolled may be representative of the community of interest. Recording of drug prescriptions occurs contemporaneously, which

Grimes, Obstet Gynecol Nov 2010, 116: 1018-19

Research using vital records should be limited to simple descriptive reports with caveats about data accuracy. Using birth certificate information for epidemiologic analyses is inappropriate because of well documented deficiencies in information quality[3]. Similarly, epidemiologic research using adminstrative databases, such as the Danish National Patient Registry, must at a minimum validate each reported outcome by chart review[9] or by patient interview.

In recent decades, the computer science concept of "GIGO" ("garbage in, garbage out") has somehow come to mean "garbage in, gospel out[10]." When computer software tackles a large database, many accept the "computerized" output as trustworthy, regardless of the quality of the input. Sadly, no fancy statistical machinations can compensate for poor-quality data. Publications relying on unconfirmed database reports of venous thromboembolism should be ignord.

Grimes. Obstet Gynecol 2010; 116: 1018-19

Editorial

Epidemiologic Research Using Administrative Databases

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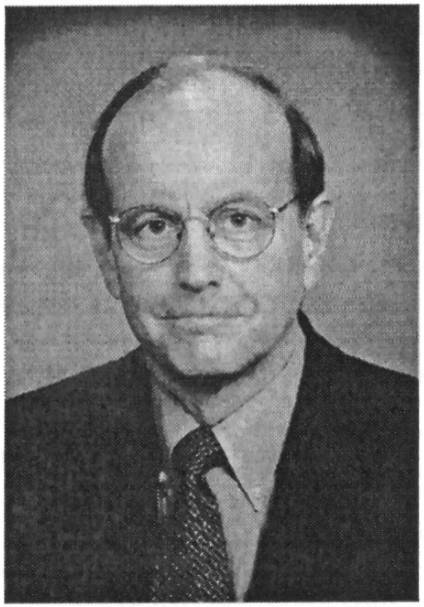

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Financial Disclosure

Dr. Grimes serves as a consultant (DSMB member) for Bayer.

Grimes, Obstet Gynecol Nov 2010, 116: 1018-19

OC and VT: Methods

National Registry of Patients (>1977)

VT diagnoses,

Previous CaVD/canc.

Pregnancies, surgery

National Registry of Medicinal products (>1995): OC use

Medication against

BP↑, DM, Hyperchol.

1995 → 2005

Cause of Deaths Registry (>1977)

Lethal VT

Statistics Denmark

PIN-codes, education

vital status, emigration

Lidegaard et al. BMJ 2009

OC and VT: Methods

National Registry of Patients (>1977)

VT diagnoses,

Previous CaVD/canc.

Pregnancies, surgery

Registry of Medicinal products (>1995):

OC use (>1995)

Anticoagulation therapy

BP↑, DM, Hyperchol.

1995 → 2001 → 2005 → 2009

1.3 million women

Cause of Deaths Registry (>1977)

Lethal VT

Statistics Denmark

PIN-codes, education

vital status, emigration

Lidegaard et al. BMJ 2011

BMJ

BMJ 2011;343:d6423 doi: 10.1136/bmj.d6423

RESEARCH

Risk of venous thromboembolism from use of oral contraceptives containing different progestogens and oestrogen doses: Danish cohort study, 2001-9


OPEN ACCESS

Øjvind Lidegaard *professor of obstetrics and gynaecology*[1], Lars Hougaard Nielsen *statistician*[1], Charlotte Wessel Skovlund *data manager and scientific assistant*[1], Finn Egil Skjeldestad *professor of clinical medicine*[2], Ellen Løkkegaard *senior registrar in obstetrics and gynaecology*[3]

[1]Gynaecological Clinic 4232, Rigshospitalet, University of Copenhagen, Denmark; [2]Department of Obstetrics and Gynaecology, Institute of Clinical Medicine, University of Tromsø, Norway; [3]Department of Obstetrics and Gynaecology, Hillerød Hospital, University of Copenhagen, Denmark

Abstract

Objective To assess the risk of venous thromboembolism from use of

thromboembolism was not increased with use of progestogen only pills or hormone releasing intrauterine devices. If oral contraceptives with

OC and VT: Progestogen type Confirmed versus non-use

ug EE	Neta	Lng	NGM	Deso	Gest	Drsp	CPA
50	6.2 3.0-13.2	4.5 2.9-6.9	Patch	na	na	na	na
30-40	2.2 1.1-4.5	3.0 2.4-4.0	3.5 2.9-4.3	6.6 5.6-7.8	6.2 5.6-7.0	6.4 5.4-7.5	6.4 5.4-7.5
20	na	na	na	4.8 4.1-5.6	5.1 4.4-5.9	6.9 4.2-11.5	na

		Vg. Ring	
POP	0.7 0.3-1.5		0.6 0.2-1.9
Mirena		0.7 0.5-1.1	

Lidegaard et al. BMJ 2011; 343: d6423

Combined oral contraceptives, venous thromboembolism, and the problem of interpreting large but incomplete datasets

Jürgen Dinger,[1] Samuel Shapiro[2]

[1]Director, ZEG - Berlin Center for Epidemiology and Health Research, Berlin, Germany
[2]Visting Professor of Epidemiology, Department of Epidemiology, University of Cape Town, Cape Town, South Africa

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Received 11 November 2011
Accepted 14 November 2011

Background

In 2009, Lidegaard *et al.*[1] published findings in the *British Medical Journal*, derived from a Danish retrospective cohort study of the risk of venous thromboembolism (VTE) associated with the use of combined oral contraceptives (COCs). Their analysis was based on data derived from national health registries, and they concluded that "oral contraceptives with desogestrel, gestodene, or drospirenone were associated with a significantly higher risk of VTE than oral contraceptives with levonorgestrel". That report has previously in the publication differ from those mentioned in the re-analysis submitted to EMA (one example is given below).

Since the mid-1990s there has been heated debate regarding the risk of VTE associated with the use of different progestogens, and those who have followed the discussion can only note with concern its confrontational and increasingly sharp tone, which, unfortunately, is also reflected in the published responses to the re-analysis,[5–7] and more particularly in the authors' replies.[8 9]

The heat of the debate may have some-

Dinger & Shapiro, on the road again

We conclude that the best evidence continues to suggest that the increased risk of VTE among COC users is a class effect. In the Danish data an analysis confined to women who used COCs for the first time from 2001 onward did not support any differential effects of progestogens. Surprisingly, this information was neither presented nor discussed in the published re-analysis.[4] Any potential differences, if they exist at all, are probably beyond the resolving power of the 'epidemiological microscope'.

Dinger & Shapiro. J Fam Plan Repr Health Care2011: Nov. 14.

BMJ

BMJ 2012;344:e2990 doi: 10.1136/bmj.e2990

RESEARCH

Venous thrombosis in users of non-oral hormonal contraception: follow-up study, Denmark 2001-10

OPEN ACCESS

Øjvind Lidegaard *professor*[1], Lars Hougaard Nielsen *statistician*[1], Charlotte Wessel Skovlund *data manager*[1], Ellen Løkkegaard *senior registrar*[2]

[1]Gynaecological Clinic 4232, Blegdamsvej 9, DK-2100 Copehagen Ø, Juliane Marie Centre, Rigshospitalet, University of Copenhagen, Denmark; [2]Department of Obstetrics and Gynaecology, Hillerød Hospital, University of Copenhagen, Denmark

Abstract

Objective To assess the risk of venous thrombosis in current users of

Conclusion Women who use transdermal patches or vaginal rings for contraception have a 7.9 and 6.5 times increased risk of confirmed

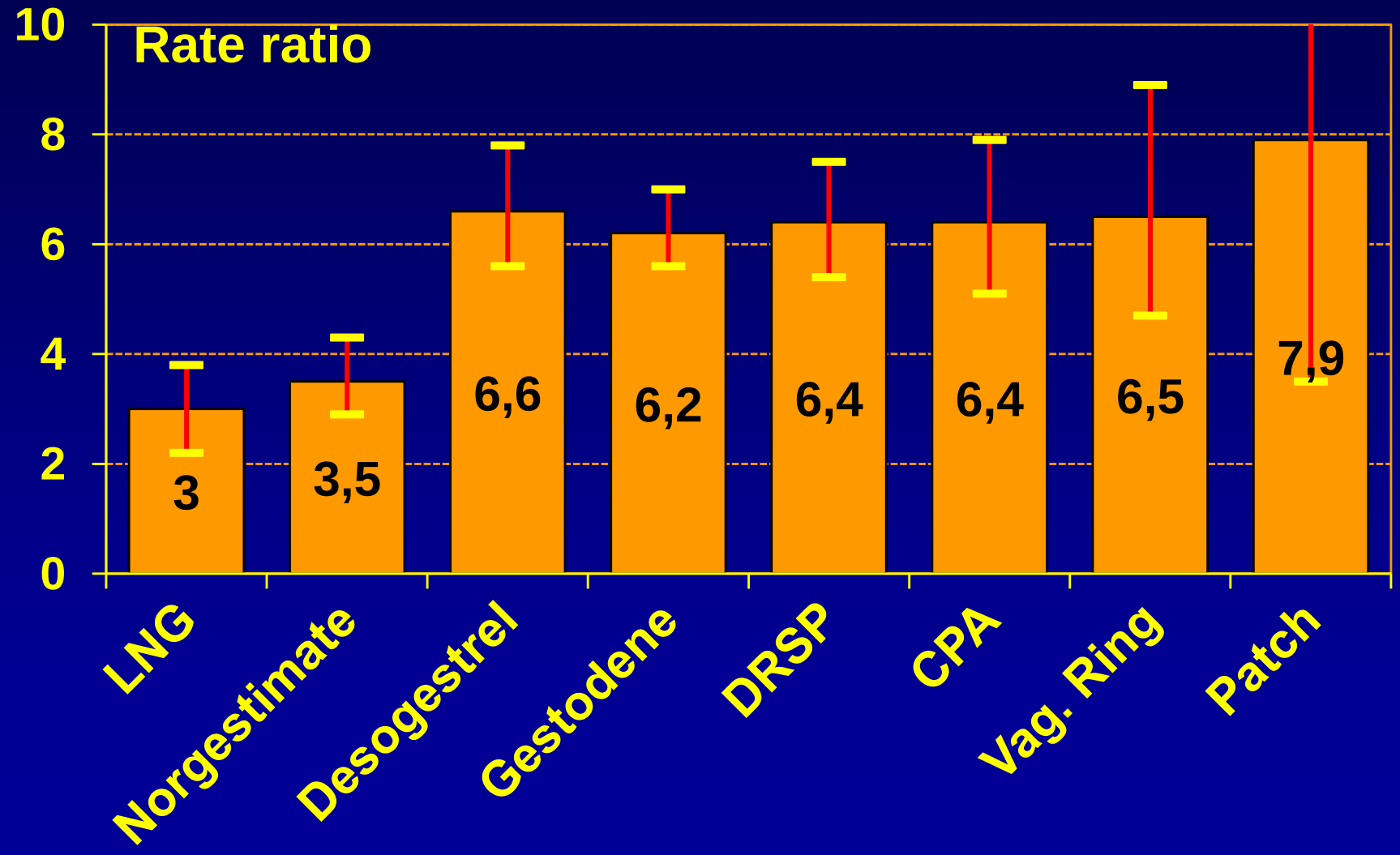
OC and VT: Progestogen type Confirmed versus non-use

ug EE	Neta	Lng	NGM	Deso	Gest	Drsp	CPA
50	6.2 3.0-13.2	4.5 2.9-6.9	7.9 3.5-17.7 ← Patch	na	na	na	
30-40	2.2 1.1-4.5	3.0 2.4-4.0	3.5 2.9-4.3	6.6 5.6-7.8	6.2 5.6-7.0	6.4 5.4-7.5	6.4 5.4-7.5
20	na	na	na	4.8 4.1-5.6	5.1 4.4-5.9	6.9 4.2-11.5	na
				6.5 4.5-8.9 Vaginal Ring			
POP	0.7 0.3-1.5			0.6 0.2-1.9			
Lng-IUS		0.6 0.4-0.8					

Lidegaard, BMJ 2012; 344: e2990

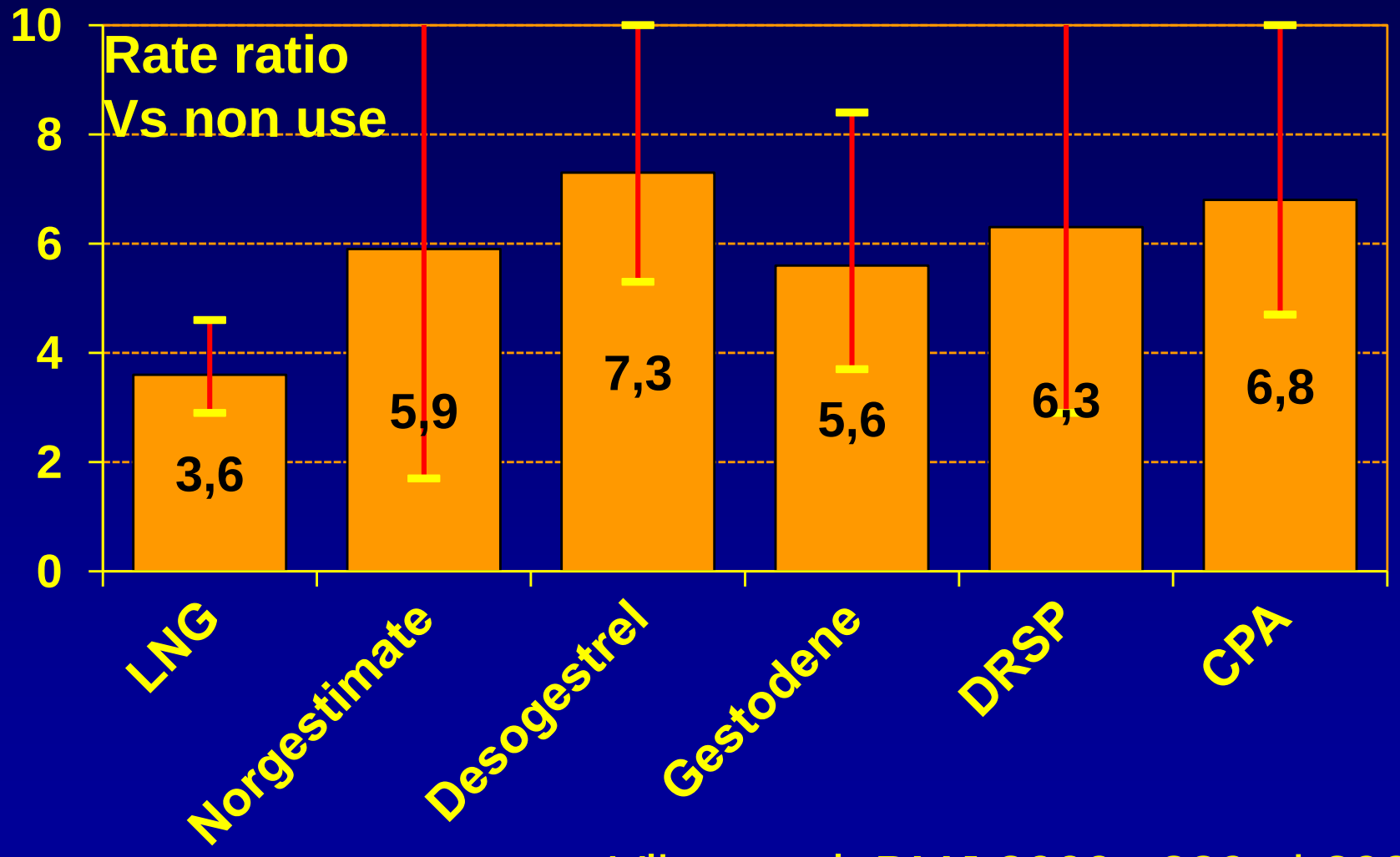
Relative risk versus non-use

Confirmed events only



Lidegaard et al. BMJ 2011; 343: d6423 + 2012; 344: e2990

Relative risk versus non-use



Vlieg et al. BMJ 2009; 339; b2921

…….on the road again

Publication in BMJ on May 10, 2012

- Anne Szarewski (14.5.2012)
  "…biologically nonsensical results"

…….on the road again

Publication in BMJ on May 10, 2012

- Anne Szarewski (14.5.2012)
- Samuel Shapiro (16.5.2012)
  "..the Danish registry is an unsuitable resource for the evaluation of VTE risk"

…….on the road again

Publication in BMJ on May 10, 2012

- Anne Szarewski (14.5.2012)
- Samuel Shapiro (16.5.2012)
- Mary E. Gaffield (16.5.2012)
  "These new data .. may lead to a new (unfounded) scare…."

…….on the road again

Publication in BMJ on May 10, 2012

- Anne Szarewski (14.5.2012)
- Samuel Shapiro (16.5.2012)
- Mary E. Gaffield (16.5.2012)
- Julie M Chandler (17.5.2012)

  “Higher abortion rate in areas where ….prescribing restrictions are in place”

…….on the road again

Publication in BMJ on May 10, 2012

- Anne Szarewski (14.5.2012)
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- Julie M Chandler (17.5.2012)
- Anne L Connolly (18.5.2012)

"…poor studies such as this one…"

…….on the road again

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- Julie M Chandler (17.5.2012)
- Anne L Connolly (18.5.2012)
- Jørgen Jespersen (19.5.2012)

  "We find no reason to repeat the clear and concise arguments by Anne Szarewski"

VT and drospirenone

	VT no	Risk /10,000	Rate ratio DRSP/2nd gen
Dinger[07]	118	9.1	1.0 (0.6-1.8) 4th/2nd
Vlieg[09]	1,524	na	1.7 (0.7-3.9) 4th/2nd
Lidegaard[09]	4.213	7.8	1.6 (1.3-2.1) 4th/2nd
Dinger[10]	680	na	1.0 (0.5-1.8) 4th/2nd
Parkin[11]	61	2.3	2.7 (1.5-4-7) 4th/2nd
Jick[11]	186	3.1	2.8 (2.1-3.8) 4th/2nd
Lidegaard[11]	4,246	9.3	2.1 (1.6-2.8) 4th/2nd

IR = incidence per 10,000 women years

BMJ Editorial Nov 2011

This new study has tackled many of the concerns expressed about the earlier investigation. Although unpalatable to some, it is difficult not to conclude that combined oral contraceptives with desogestrel, gestodene, or drospirenone confer a higher risk of venous thromboembolism than those with levonorgestrel.

Philip Hannaford. BMJ 2011; 343: d6592

VT and drospirenone

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Dinger[07]	118	9.1	1.0 (0.6-1.8) 4th/2nd
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Lidegaard[11]	4,246	9.3	2.1 (1.6-2.8) 4th/2nd
FDA Kaiser[11]	625	7.6	1.5 (1.2-1.9) 4th/2nd
Gronich[11]	518	8.6	1.7 (1.0-2.7) 4th/2nd
Bird[13]	354	18.0	1.9 (1.5-2.4) 4th/2nd

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Combined hormonal contraceptives and the risk of venous and arterial thromboembolism and cardiovascular death: misuse of automated databases

Samuel Shapiro

Visiting Professor of Epidemiology, Department of Family Medicine and Public Health, University of Cape Town School of Medicine, Cape Town, South Africa

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samshap@mweb.co.za

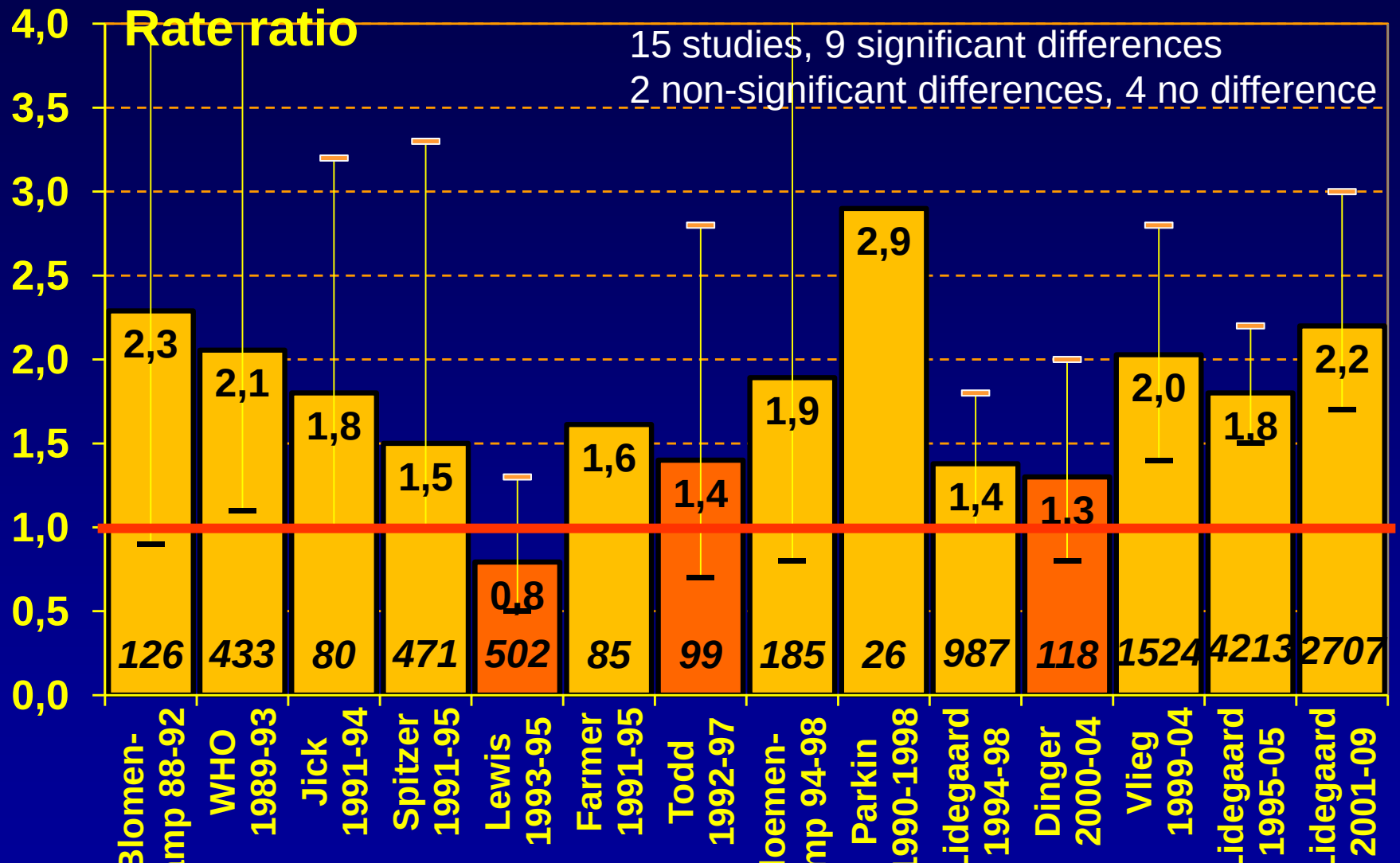
ABSTRACT

Background In December 2011, the US Food and Drug Administration (FDA) convened a public Advisory Committee meeting to review evidence from a study commissioned by the agency. An analysis of findings derived from four databases was published on the FDA website, and presented at the meeting. Among users of combined hormonal contraceptives containing ethinylestradiol (EE) plus drospirenone (DRSP) the risks of venous (VTE) and arterial thromboembolism (ATE) were higher than

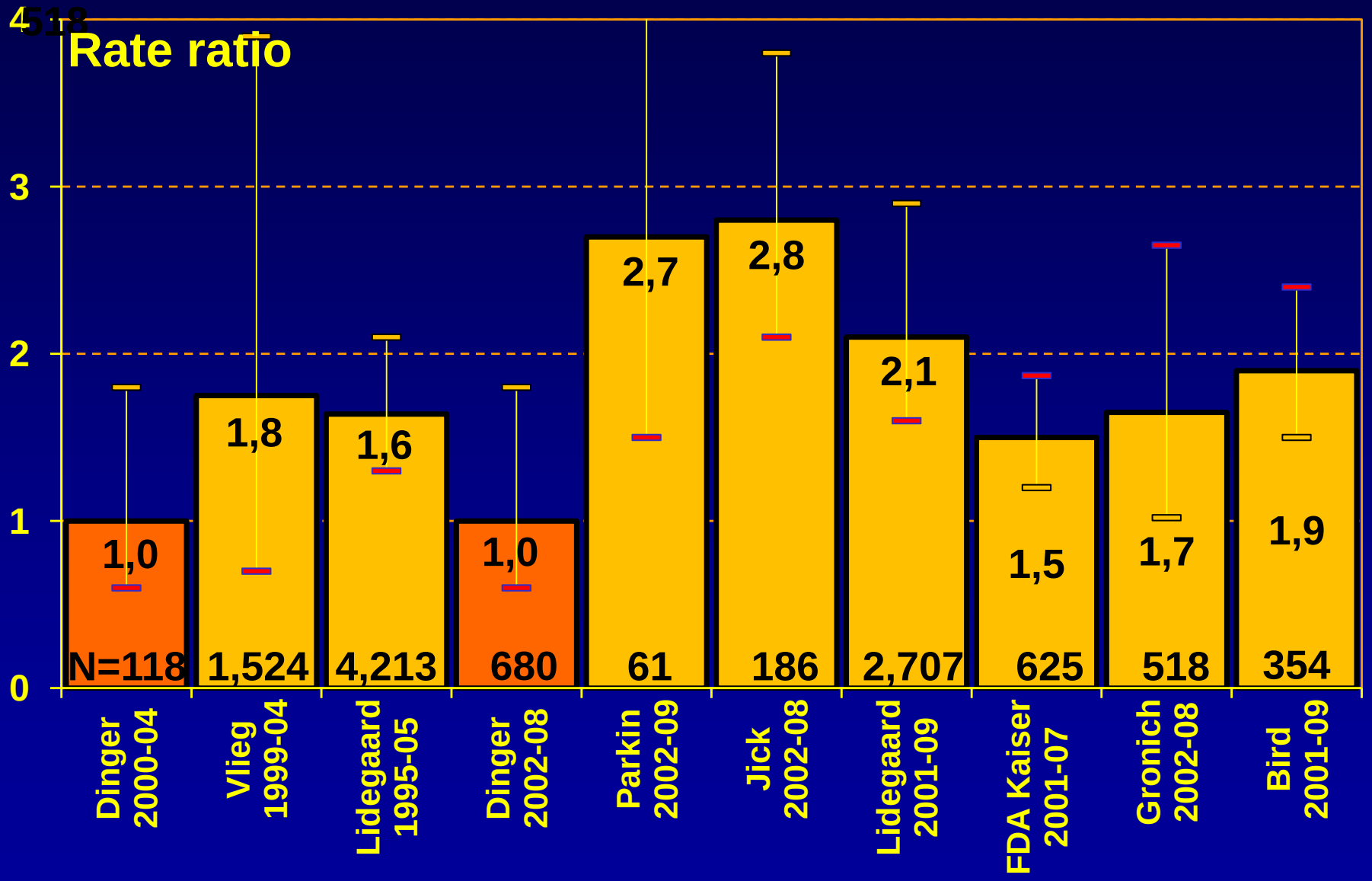
[myocardial infarction (MI) and stroke combined], in users of recently introduced combined estrogen/progestogen hormonal contraceptives (CHCs).[1] At the time of the meeting the findings had only been published on the FDA website, but not in a peer-reviewed journal.

The investigators concluded that their data "[provided] another positive finding to the increasing body of evidence linking [drospirenone (DRSP)] to increased risk of VTE relative to standard low-dose

3rd versus 2nd generation COC



COC with DRSP vs LNG

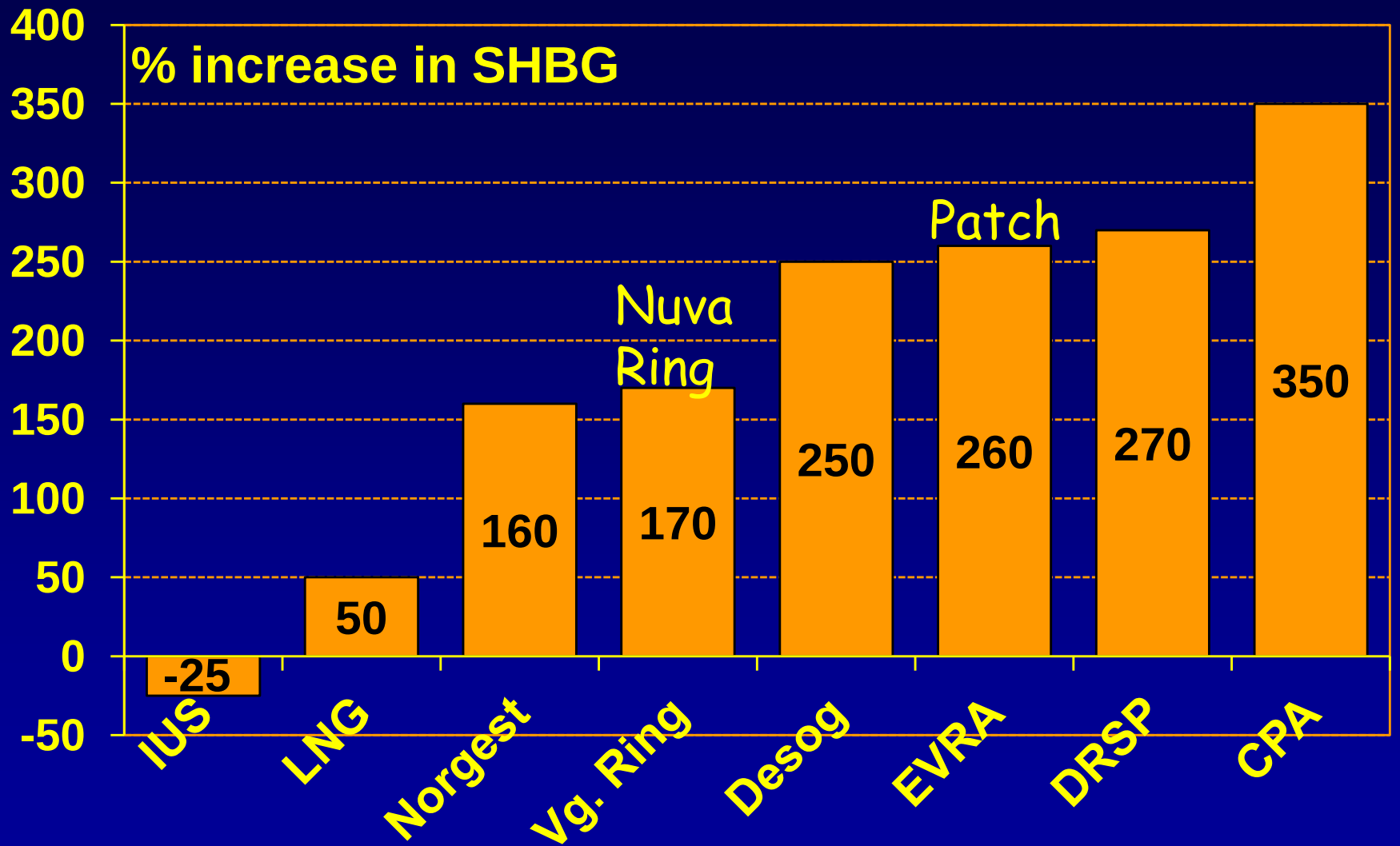


George Monbiot

One of the most widespread human weaknesses is our readiness to accept claims that fit our beliefs and reject those that clash with them. We demand impossible standards of proof when confronted with something we don't want to hear, but will believe any old cobblers if it confirms our prejudices:

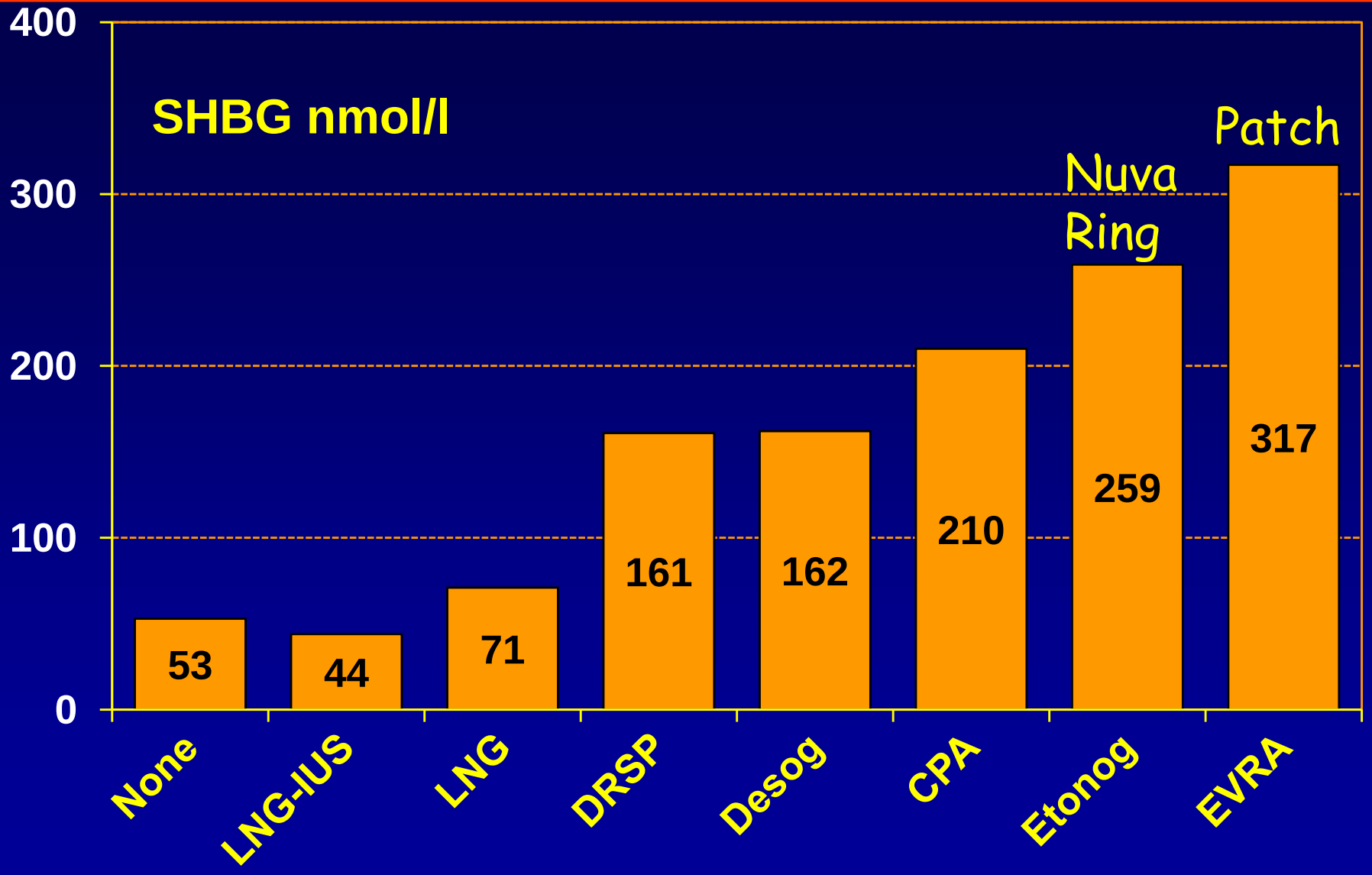
Guardian, November 22, 2011

Hormonal contraception and SHBG



Odlin et al. Acta Obstet Gynecol Scand 2002; 81: 482-90

Hormonal contraception & SHBG



Raps et al. Thrombosis Haemostasis 2012; doi: 10.1111

OCs and venous thrombosis

Current status October 2013

POP:	**1**	
LNG-IUS:	**<1**	
2nd gen:	**3**	
3rd gen:	**6**	(Vg. Ring)
4th gen:	**6**	(also low dose)
Patch	**7**	

HC and thrombotic stroke Reference: Non-users

- All women in Denmark 15-49 years old during the period January 1995 through December 2009 (15 years)
- Data from four National registries
- Included: 1,626,158 women

  14,251,063 women years

  4,914,401 current use

  3,311 thrombotic strokes

Lidegaard et al. N Engl J Med 2012; 366: 2257-66

HC and thrombotic stroke
Reference: Non-users

ug EE	Neta	Lng	NGM	DSG	Gest	Drsp	CPA
50	1.3 0.7-2.5	2.3 1.6-3.2	3.2 0.8-12.6	2.5 1.4-4.4	Vg.Ring	na	na
30-40	2.2 1.5-3.2	1.7 1.4-1.9	1.5 1.2-1.9	2.2 1.8-2.7	1.8 1.6-2.0	1.6 **1.2-2.2**	1.4 1.0-2.0
20	na	na	na	1.5 1.3-1.9	1.7 1.4-2.1	0.9 0.2-3.5	na
POP	1.4 0.9-2.0			1.4 0.7-2.6	Cerazette		
Mirena		0.7 0.5-1.0		0.9 0.3-2.6	Implant		

Lidegaard et al. N Engl J Med 2012; 366: 2257-66

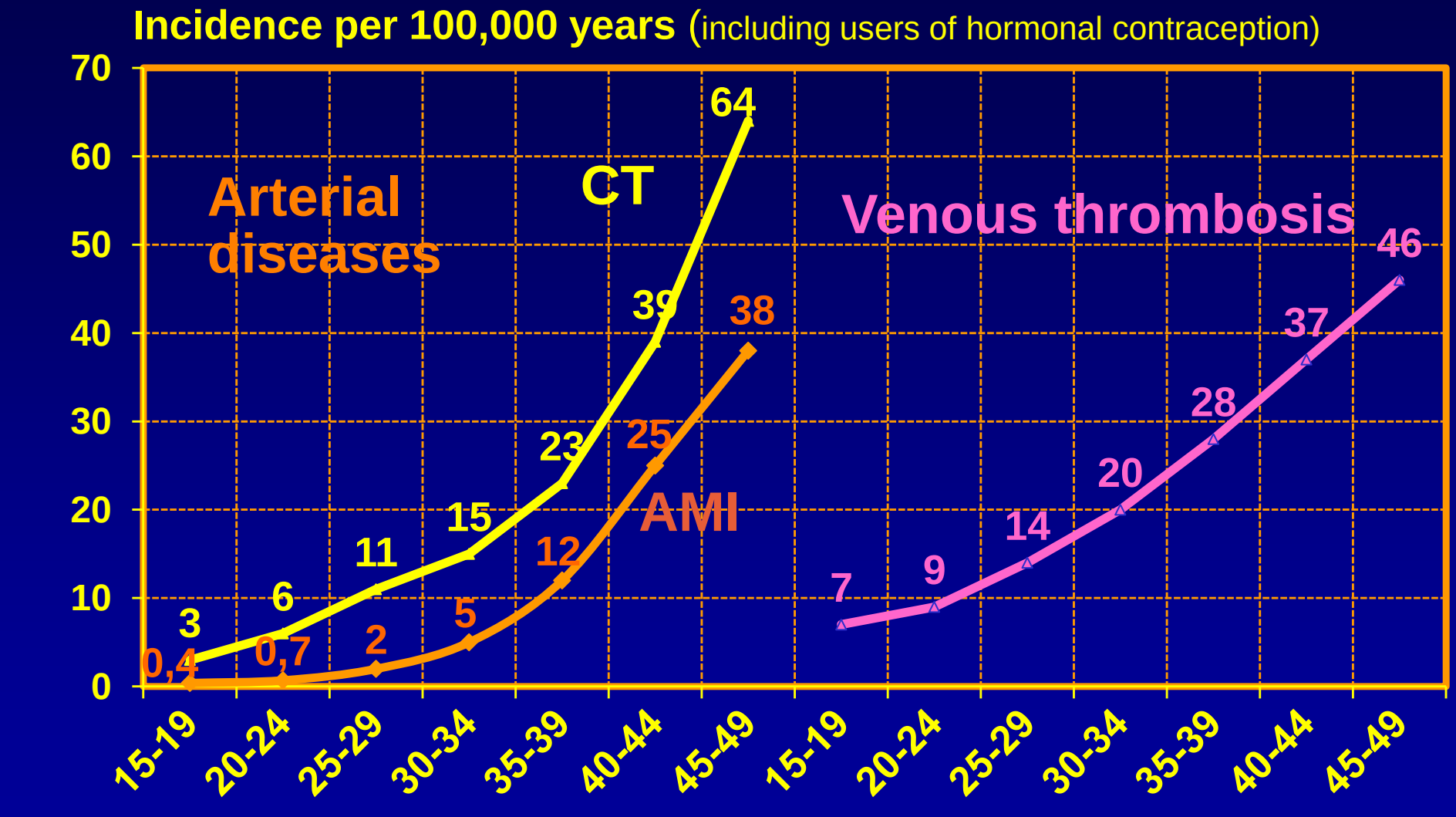
OCs and thrombosis

Current status April 2013

	VT	CT
POP:	1	1.4
LNG-IUS:	<1	1
2nd gen:	3	1.7
3rd gen:	6	1.8
4th gen:	6	1.6
Patch	8	3.2

CT, AMI and VT in DK 2001-2009*

Pregnant and puerperal women excluded



Lidegaard et al NEJM 2012 and BMJ 2011

IRF
Rationel Farmakoterapi
September 2012
7

Hormonel kontraception og tromboemboliske aspekter

*Af Øjvind Lidegaard**

Hormonel kontraception omfatter p-piller, p-plaster, vaginalring, hormonspiral, subkutant implantat samt intramuskulært gestagendepot, altså seks forskellige administrationsveje. Ud over at yde en effektiv kontraceptiv effekt indebærer brugen af hormonel kontraception også en række non-kontraceptive gevinster, for eksempel blødningskontrol og bedring af akne, som har stor betydning for den udbredte brug af hormonel kontraception.

Den væsentligste bivirkning ved

Tromboemboliske komplikationer blandt yngre kvinder

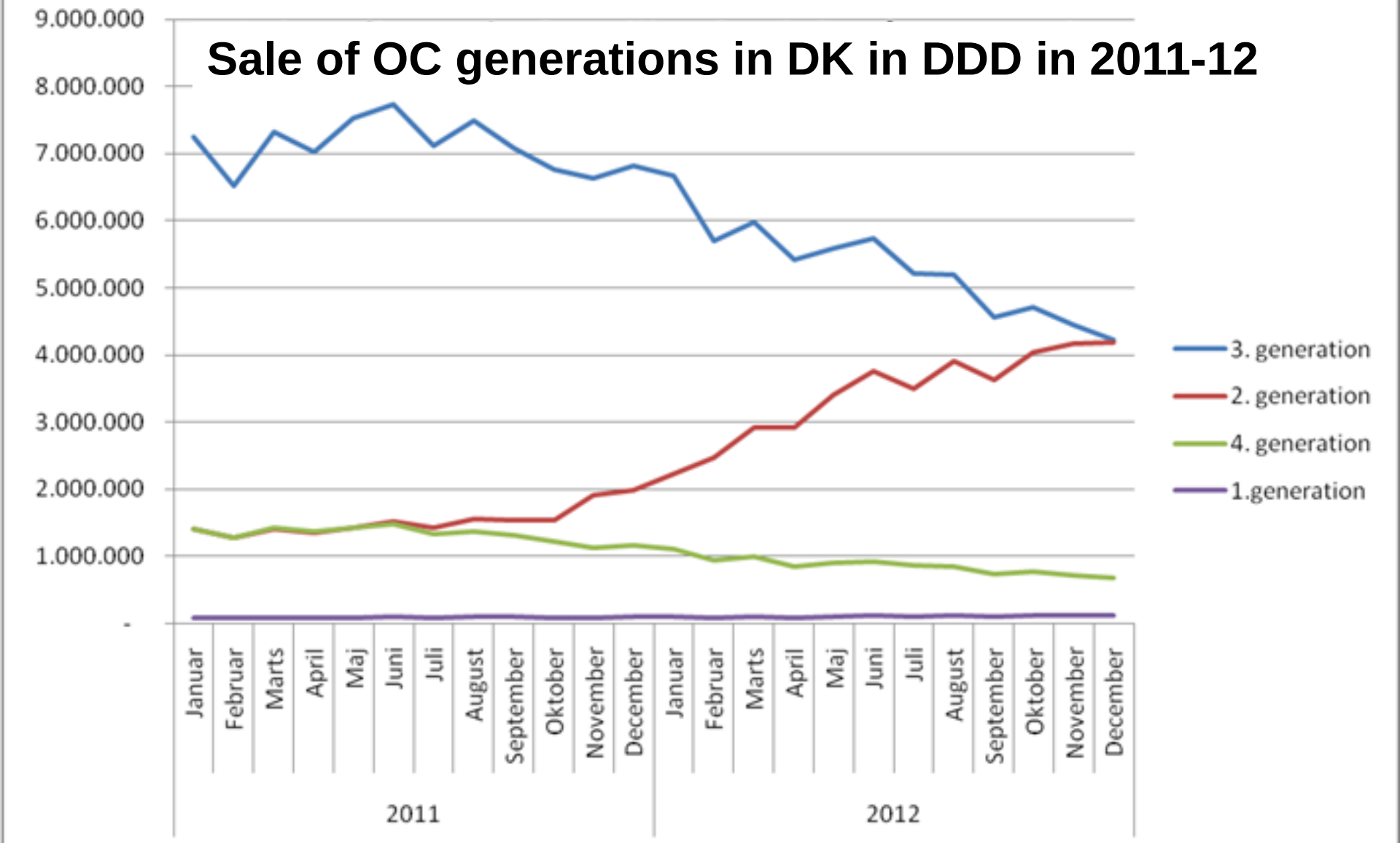
Venøs trombose

Blandt ikke-gravide kvinder under 30 år er den hyppigste tromboemboliske komplikation til hormonel kontraception den venøse trombose, som blandt kvinder, der ikke anvender hormonel kontraception, optræder med to tilfælde pr. 10.000 kvinder pr. år. Blandt kvinder i alderen 30-49 år er baggrundsincidensen i gennemsnit dobbelt så høj eller fire pr. 10.000 kvinder pr. år.

kardieinfarkt (*AMI*) samt cerebral trombose og tromboemboli. Blandt ikke-gravide kvinder under 30 år forekommer der 0,6 arterielle tromboser pr. 10.000 pr. år, mens der blandt kvinder mellem 30 og 49 år i gennemsnit forekommer fem tilfælde pr. 10.000 kvinder pr. år. De vigtigste risikofaktorer for arteriel trombose er høj alder, rygning, hyperkolesterolæmi, diabetes, hypertension og migræne, især migræne med aura.

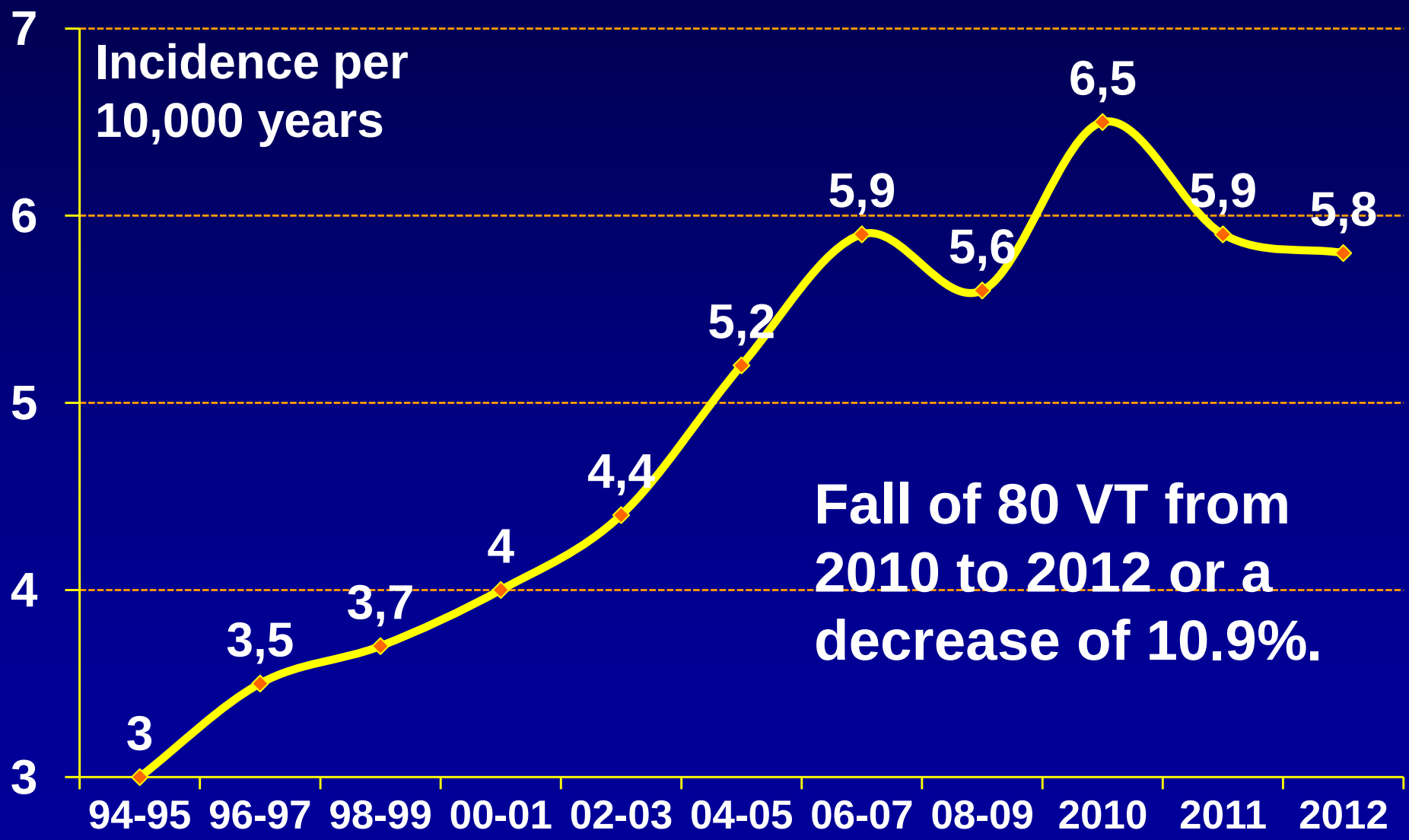
Hormonel kontraception

Sale of OC generations in DK in DDD in 2011-12



http://laegemiddelstyrelsen.dk/da/topics/bivirkninger-og-forsoeg/bivirkninger/nyheder/laeger-foelger-anbefalinger-for-brugen-af-p-piller

Venous thrombosis in DK 1994-2012 in non-pregnant women 15-44 years old



Hormonal contraception and venous thrombosis

- George Monbiot, Guardian, March 2010

”In fighting for science, we subscribe to a comforting illusion: That people can be swayed by the facts”

http://www.monbiot.com/2010/03/08/the-unpersuadables/

PCOS and venous thrombosis

- Data from US Thomson Reuters MarketScan database 2003-2008.
- Relative risk of VT

	18-24	25-34	35-45
+HC +PCOS/-PCOS	2.9	2.0	1.8
	2.2-3.9	1.7-2.4	1.5-2-1
-HC +PCOS/-PCOS	3.8	2.7	2.2
	2.6-5.4	2.3-3.2	1.9-2.5

Okoroh et al. AJOG 2012; 207: 377.e1-8

Two new studies

- Data from US IMS claims database 1.6 mio users of HC 2001-2009. Women with PCOS matched with propensity scores. VT
- +PCOS: n= 46.867 (2.9%) 34/10,000 wy

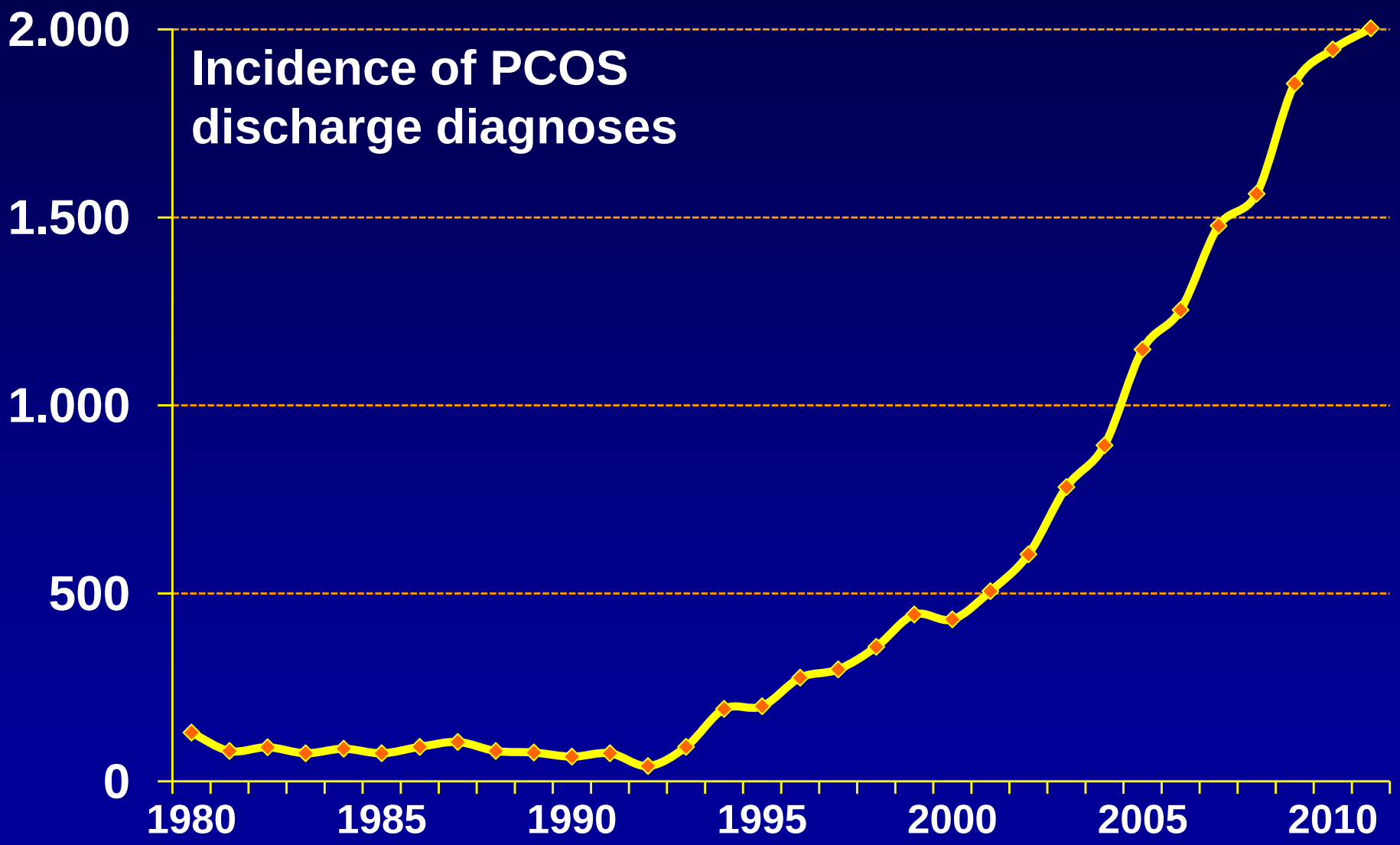
  - PCOS: n= 43,506 11/10,000 wy

  RR +PCOS/-PCOS: 2.1 (1.4-3.2)

  RR in non-users of HC: 2.1 (1.6-3.1)

*) Bird et al. CMAJ 2013

PCOS in Denmark from 1977-2011



Methods

National Health Registry (>1977)

BMI, VT diagnoses,

Previous CaVD/canc.

Pregnancies, PCOS

Registry of Medicinal products (>1995):

OC use (>1995)

Anticoagulation therapy

BP↑, DM, Hyperchol.

1995 → 2001 → 2012

1,417,473 women

Cause of Deaths Registry (>1977)

Lethal VT

Statistics Denmark

PIN-codes, education

vital status, emigration

Lidegaard et al. 2014

Results, BMI

BMI	Women years	VT All	VT Conf	RR_{adj}*
<18.5	108,098	32	20	0.94 0.6-1.5
18-24.9	1,763,896	566	372	Reference
25-30	614,167	277	175	1.31 1.1-1.6
>30	360,131	273	167	2.20 1.8-2.6

*) Adjusted for age, year, education, PCOS and hormonal contraception

Results, PCOS

	Women		Relative risk of VT	
Group	**years**	**VT**	**RR**adj*	**RR**adj**
No PCOS	7.002.784	4.088	1	
+ PCOS	55.739	54	1.9 1.5-2.5	
Restricted to women with known BMI				
No PCOS	2.809.138	719	1	1
+ PCOS	37.154	15	1.7	1.4 08-2.3

* Adjusted for age, year, education and hormonal contraception

**Adjusted for the same + body mass index

Results 30-40 µg EE

	Wom yrs	VT	RR*	RR**
NETA	29,275	9	2.3 1.2-4.5	3.6 1.1-11.3
LNG	303,789	186	3.3 2.9-3.9	3.7 2.3-6.0
NGM	384,231	165	3.7 3.1-4.4	4.2 3.0-6.0
DSG	214,875	219	6.7 5.8-7.7	5.5 3.7-8.2
GSD	839,361	773	6.6 6.0-7.2	7.5 6.0-9.4
DRSP	353,894	253	6.3 5.5-7.2	7.4 5.4-10.0
CPA	156,991	119	6.2 5.1-7.4	8.2 5.5-12.3

*) Adjusted for age, year, education, and PCOS

**) Adjusted for age, year, education, PCOS and BMI

Results 20 µg EE and non-oral

	Wom yrs	VT	RR*	RR**
LNG	303,789	186	3.3 2.9-3.9	3.7 2.3-6.0
DSG	648,034	387	6.7 5.8-7.7	5.5 3.7-8.2
GSD	660,635	355	6.6 6.0-7.2	7.5 6.0-9.4
DRSP	62,743	44	6.3 5.5-7.2	7.4 5.4-10.0
Vag ring	69,178	52	6.2 5.1-7.4	8.2 5.5-12.3
DSG only	57,969	11	1.1 0.6-1.9	0.8 0.2-3.4
LNG-IUS	341,505	52	0.6 0.5-0.8	0.8 0.4-1.5

*) Adjusted for age, year, education, and PCOS

**) Adjusted for age, year, education, PCOS, and BMI

Conclusion

- Women with PCOS have a doubled risk of VT
- Half of this increase is due to adiposity
- The increased risk is not explained by HC use
- The difference in risk of venous thrombosis between users of 3rd/4th and 2nd generation oral contraceptives is not explained by PCOS or by differences in body mass index.
- First choice for PCOS is 2nd gen. pills

Conclusion acne

- Acne is a minor problem for many, and a serious problem for few
- Oral contraceptives relieve acne symptoms
- First choice: Diet counselling
- Second choice: A 2nd gen. pill
- Third choice: A 3rd/4th gen pill.
- Fourth choice: antibiotics

Hormonal contraception and acne

Thanks for your attention

www.lidegaard.dk/slides

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Conflicts of interest: Lidegaard has been an expert witness in a legal process in USA in 2011 and 2012.