



CONTRACEPTION AND ABORTION

Key issues:

- even in societies where rates of contraception use are considerably high, abortions are a common practice and increased access to family planning methods does not decrease abortion rates;
- women who have abortions frequently report use of contraceptives during the intercourse (depending on the research, a half or even straight majority of participant women),
- population studies show considerably higher contraceptive failure rates than clinical tests (pills, condoms),
- around a half of oral contraception users miss one or more pills within a cycle,
- the typical woman will experience contraceptive failure 1.8 times in her life.

Increased access to contraception is not the answer to widespread abortion. No contraceptive method is fully efficient and a vital part of abortions is a consequence of ineffective contraception or user errors.

Does contraception eliminate abortion?

The major argument illustrating the fact that widespread availability of contraception does not reduce abortion comes from the United States. "Contraceptive use in the United States is virtually universal among women of reproductive age: 98 percent of all women who had ever had intercourse had used at least one contraceptive method", highlighted "The National Survey of Family Growth". Despite the fact, around 3/4 million abortions are performed yearly in the United States. The research shows that American women use mostly the contraceptive methods that are commonly considered reliable: contraceptive pills are the leading method in the United States (in 2002 used by 11.6 million women of reproductive age). The second most often used method of avoiding pregnancy is sterilisation (used by 10.3 million women). It is worth mentioning that in 2002, 26 million American women of reproductive age (42% of the group) used medical family planning services at least once. (W.D. Mosher, G.M. Martinez, A. Chandra, et al., *Use of Contraception and Use of Family Planning Services in the United States: 1982-2002*, CDC, „Advance Data From Vital and Health Statistics“, Nr. 350, 2004, p. 1-34)

A French survey on adolescents with abortion experience performed in 2007 was based on data on 1,525 women aged 13-19. That year, 30,000 French teenage girls had an abortion (what constitutes 14.3%

of the total quantity of abortions in the country). As they analysed the reasons for abortion among the French teenagers, the researchers came to a conclusion that 2/3 of the pregnancies occurred as a result of contraception failure. After an analysis of unreliability of individual contraceptive methods, the researchers named the following reasons for pregnancy: inconsistent use of contraceptive pills (19%), slipped or ripped condom (26%). Only a small proportion (3.4%) of participants had never used contraception prior to the terminated pregnancy. It is worth mentioning that in 84% cases of condom users, the pregnancy resulted from slipped or ripped condom, whereas 93% users of contraceptive pills became pregnant as a result of improper or inconsistent use. The research showed as well that 9% teenagers who had an abortion stated that the decision was made solely on request of the family or the partner. When asked in a less uncompromising way, 10% of the teenagers responded that they opted for abortion at the family's, and 12% at the partner's request. (C. Moreau, J. Trussell, N. Bajos, *Contraceptive Paths of Adolescent Women Undergoing an Abortion in France*, in: „Journal of Adolescent Health”, Vol. 50, Nr. 4, 2012, p. 389-394)

A survey that involved 150 women living in Copenhagen with history of one (50 women), two (50 women) and three (50 women) abortions showed that within the first group only 32% did not use contraception compared with 38% in the second group and 41% in the third. That means that almost 70% women who underwent their first abortion and 60% of those who had three abortions had been using contraceptives that failed. Traditional and barrier contraception methods were used by 54% women from the first group, 58% from the second group and 35% from the third group. Contraceptive pills and intrauterine devices were used by 14% women in the first, 2% in the second and 22% in the third group. (M. Osler, H.P. David, J.M. Morgalle, *Multiple induced abortions: Danish experience*, in: „Patient Education and Counseling”, Vol. 31, 1997, p. 83-89)

Almost 70% women who underwent their first abortion and 60% of those who had three abortions had been using contraceptives that failed.

An American analysis focused on data on 10,683 women who had an abortion within the years 2000-2001. In the month previous to conception, 54% women used contraception, including condoms – 28%, and contraceptive pills – 14%. It is worth mentioning that in the group of women who opted for abortion, 46% had not used contraceptives during the month prior to conception, but 38% had used contraception even before that. That means a vast majority of women who had an abortion had used contraception beforehand. The analysis was aimed at determining causes of the pregnancies. On the basis of selfassessment performed by participant women considering rules for using contraception, it was stated that among women who became pregnant despite using contraception, percentage of those who declared perfect method use was 13% for pills and 14% for condoms. A survey aimed at reasons of unreliability of contraceptive pills allowed to state that among women who became pregnant and underwent abortion despite using the pills, 75.9% used them improperly (the women named the following reasons: forgot to take pills – 45.1%, away from home and didn't have pills – 15.9%, ran out of supplies – 10.3%, sick – 7.7%). Among women who got pregnant despite condoms used by their partners and decided to have an abortion, in 41.6% cases condom broke or slipped and 49.3% participant reported inconsistent or improper use (women provided the following reasons: “didn't think I would get pregnant” – 20.4%, “didn't have it with me” – 14.3%, “not expecting to have sex” – 12.8%, “forgot” – 7.1%, “didn't feel like using” – 5.6%, “partner didn't feel like using” – 3.5%). The research paper additionally provides the number of abortions performed in the USA in spite of

using the “morning-after” pill. The authors state that 17,000 abortions per year (1.3%) occurred after the use of emergency contraceptive pills. The authors conclude: “On the basis of our survey findings, we estimate that of the 1.3 million women who underwent induced abortions in 2000, 608,000 had not been using a contraceptive method around the time they became pregnant, 610,000 had been using a method but not consistently or correctly, and 95,000 had thought they were using the method perfectly but became pregnant because of method failure”. (R.K. Jones, J.E. Darroch, S.K. Henshaw, *Contraceptive Use Among U.S. Women Having Abortions in 2000-2001*, in: “Perspectives on Sexual and Reproductive Health”, Vol. 34, Nr. 6, 2002, p. 294-303)

A report published in 2014 by the British Pregnancy Advisory Service (BPAS), the biggest provider of abortion services in Britain, was based on information from 150.000 women who used services of the institution, aged 15 and over. As provided within, “two thirds (66%) of women having an abortion at BPAS reported using a form of contraception when they conceived”. Methods used by the women were: contraceptive pill, the most popular contraceptive in the UK: 40%, condoms, used by a fourth of the British: 35%. Ann Furedi, BPAS chief executive, said: “Contraception fails and sometimes we fail to use it properly. In our experience women are trying hard to avoid unwanted pregnancy, or sometimes vastly underestimate their own fertility”. (British Pregnancy Advisory Service, Press Office, *Women trying hard to avoid unwanted pregnancy, research shows*, Press Release, published 04 February 2014)

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Article “Condom failure is on the increase” published by the British Medical Journal, described a cohort survey of 4,666 women who used abortion services of Marie Stopes Centre in Leeds between 1989 and 1993. The survey was to determine reasons for contraception failure. As shown by its results, condom failure rate leading to unwanted pregnancy has increased over the years. In the last year of the survey, over 46% women claimed that the reason for unwanted pregnancy was condom failure. (D. Carnall, *Condom failure is on the increase*, in: “British Medical Journal”, 1996 Apr 27; 312(7038):1059)

A research on 163 women who had an abortion in France showed that 45.8% women used contraceptive pills or IUDs (intrauterine devices) within 6 months before conception, 20.5% used condoms, 10.1% used other contraceptives and only 13.7% women had no experience with contraception. The data indicate that shortly before abortion 25.2% women had not used contraceptives, 23.2% used pills, 9.4% – an IUD, 23% – condoms, 19.2% – other methods. (N. Bajos, A. Lamarche-Vadel, F. Gilbert, et al., *Contraception at the time of abortion: highrisk time or high-risk women?*, in: „Human Reproduction”, Vol. 21, Nr. 11, 2006, p. 2862-2867)

Another French cohort survey performed on 2,864 participants showed that from 1,034 participants who refused to have an abortion within 5 preceding years or did not plan their pregnancy, 65% used contraception (21% – pills, 9% – IUDs, 12% – condoms, 23% – other contraceptives). Out of 2,864 women aged between 18-44 without intention of pregnancy and still sexually active, only 2.7% refused to use contraception. In spite of that, 33% pregnancies of the women had been unplanned and, in 50%, aborted. (N. Bajos, H. Leridon, H. Goulard, P. Oustry, et al., *Contraception: from accessibility to efficiency*, in: „Human Reproduction”, 2003, Vol. 18, Nr. 5, p. 994-999).

A cohort survey conducted on clients of family planning clinics in Ontario (1998-1999) showed that vast majority (90%) of 1221 participants used contraception. More than a half (55.3%) reported use of contraceptives during the intercourse (within the group, 39.6% used oral contraception and 60.2% – condoms). Based on the analysis, risk factors for multiple abortions have been isolated. These were: oral contraceptive use at the time of conception (second abortion: 2.17 times greater, third and subsequent abortion: 2.6 times greater), history of physical abuse by a male partner (second abortion: 2.04, third or subsequent abortion: 2.78), history of sexual abuse or violence (second abortion: 1.50, third or subsequent abortion: 2.53), history of sexually transmitted disease (second abortion: 1.50, third or subsequent abortion: 2.26). The researchers indicate that 35.5% abortions in Canada and 48% in the USA are repeat procedures. (W.A. Fisher, S.S. Singh, P.A. Shuper, M. Carey, F. Otchet, et al. *Characteristics of women undergoing repeat induced abortion*, in: „The Canadian Medical Association Journal”, Vol. 172, Nr. 5, 2005, p. 637-41)

An Australian cohort survey of 3,434 patients of abortion clinics (1996-2006) was aimed at identifying various factors for abortion in southern part of the country. The survey showed that 67% women used contraceptives during the intercourse, therein: 33.4% – injections, 35.9% – barrier methods, 27.8% – hormonal methods, 2.9% – natural methods of family planning. (W. Abigail, Ch. Power, I. Belan, *Changing patterns in women seeking terminations of pregnancy: A trend analysis of data from one service provider 1996-2006*, in: “Australian and New Zealand Journal of Public Health”, Vol. 32, 2008, p. 230-37)

The “Contraception” magazine published a research paper on a cohort survey of 2000 Spanish women. Within the research period (1997-2007) percentage of contraception users increased from 49.1% to 79.9%. The most popular contraceptives were condoms (increase in usage from 21% to 38.8%) and contraceptive pills (increase in usage from 14.2% to 20.3%). Percentage of naprotechnology users within the period dropped from 0.9% to 0.5%. At the same time, abortion rate rose from 5.52 to 11.49 abortions per 1000 women. The authors suppose that the increase in abortion rates may be due to improper and inconsistent use of contraceptives. Dr Dianne Irving, a bioethicist from the Georgetown University commented the survey: “the need for more study is >>non-existent<< because >>years of scientific studies around the world<< have established the link between contraception and abortion. (...) Since it is ... a long-recognized and documented scientific fact that almost all so-called ‘contraceptives’ routinely fail at statistically significant rates resulting in ‘unplanned pregnancies’, is there any wonder that elective abortions are socially required in order to take care of such ‘accidents’?” She also underlined that the survey did not include abortions resulting from early abortifacient methods, so it may be presumed that real abortion rate within the given period was higher than the number presented in the analysis. (J. Dueñas, I. Lete, R. Bermejo, *Trends in the use of contraceptive methods and voluntary Interruption of pregnancy in the Spanish population during 1997-2007*, in: “Contraception”, Vol. 83, 2011, p. 82-87)

Percentage of Spanish female contraception users increased from 49.1% to 79.9%. At the same time, abortion rate rose from 5.52 to 11.49 abortions per 1000 women.

American researchers – G.A. Akerlof, J.L. Hellen i M.L. concluded that it is not enough to rely solely on economic interpretations when analysing reasons for the dramatic increase in number of children born out-of-wedlock in the USA. According to them, the main reason for the rise in 1970s and in the following years was “the technology shock itself that, by ending the age-old custom of shotgun marriage,

paradoxically raised out-of-wedlock births (...). In the late 1960s and very early 1970s (well before Roe v. Wade in January 1973) many major states, including New York and California, liberalized their abortion laws. At about the same time it became easier for unmarried people to obtain contraceptives. In July 1970 the Massachusetts law prohibiting the distribution of contraceptives to unmarried people was declared unconstitutional. We have found that this rather sudden increase in the availability of both abortion and contraception we call it a reproductive technology shock is deeply implicated in the increase in out-of-wedlock births. Although many observers expected liberalized abortion and contraception to lead to fewer out-of-wedlock births, in fact the opposite happened because of the erosion in the custom of "shotgun marriages". The number of abortions to unmarried women increased drastically in the late 1960s from around 100,000 a year to over 1.2 million in the late 1980s. Thus the data do support the theory". (G.A. Akerlof, J.L. Hellen, M.L. Katz, *An Analysis of out-of-Wedlock Childbearing in the United States*, in: „The Quarterly Journal of Economics”, Vol. CXI, Nr. 2, 1996, p. 277-317)

Researchers from Moscow and the Max Planck Institute in Rostock surveyed reasons for differences in abortion rates in Belarus, Russia and Ukraine that occur despite demographical, sociological and historical similarities between the countries. All three countries have shown significant decrease of abortion rates in the last 20 years: in Belarus, from 106 abortions per 1000 women in reproductive age in 1990 to 13.5 in 2010; in Russia respectively: from 113.9 to 31.9; in Ukraine: from 82.6 to 15.1. The decrease has not occurred simultaneously within the three countries. In Russia, abortion rate was and still is higher than in the remaining two, even though Russia has the highest rate of contraception use of the three. On the other hand, abortion rates in Belarus and Ukraine decrease in spite of lesser popularity of modern contraception. (B.P. Denisov, V.I. Sakevich, A. Jasilioniene, *Divergent Trends in Abortion and Birth Control Practices in Belarus, Russia and Ukraine*, in: „PLOS ONE”, Vol. 7, Nr. 11, 2012, p. 1-10)

A French cohort study of 2,863 women was aimed at analysis of factors for contraceptive failures and factors that determine the use of emergency contraception. The survey showed that among women who used emergency contraception between 2000 and 2001, 37.5% used contraceptive pills and 18.4% – condoms. Within the group of women classified with high risk of unintended pregnancy who used "day after" pills in 2001, 25.5% used condoms and 10.4% contraceptive pills. (H. Goulard, C. Moreau, F. Gilbert, et al., *Contraceptive failures and determinants of emergency contraception use*, in: „Contraception”, Vol. 74, 2006, p. 208-213)

■ Does accessibility of birth control methods decrease the number of unplanned pregnancies?

A survey published by the Journal of the American Medical Association quoted an example of a project conducted in a Californian family planning clinic (Sacramento 1996-1998), based on an idea to provide women with contraceptives. Out of 66% women who were given condoms by their first appointment, only 33% declared their use during latest sexual intercourse. (F.H. Steward, C.C. Harper, Ch.E. Ellertson, et. al., *Clinical Breast and Pelvic Examination Requirements for Hormonal Contraception*, in: „JAMA”, May 2, 2001 – Vol. 285, No. 17, p. 2232-2239)

By use of a model of rational choice, David Paton, author of four research projects on contraception and sex education, compared pregnancy and abortion rates in British teenagers from the time preceding introduction of law that allowed teenagers under 16 years of age to use birth control methods with analogical data on teenagers subjected to the law. He analysed British local data for the years 1984-1997 and found "no evidence that greater access to family planning has reduced underage

conceptions or abortions". (D. Paton, *The economics of family planning and underage conceptions*, in: „Journal of Health Economics”, Vol. 21, Nr. 2, 2002, p. 207-225)

What is the real effectiveness of contraception?

Outcome of American cohort research performed in 1995 on 10,847 women aged 15-44, published in “Family Planning Perspectives” in 1999, provides information on factual unreliability of individual contraceptive methods. There are significant differences in contraception failure rate, according to age, marital and economic status, and even a woman’s race. The table below provides exemplary failure rates of contraceptive pills and condoms in certain social groups characterised by lowest rates of contraception effectiveness.

Table. Percentage of women experiencing contraceptive failure during the first 12 months of method use among teenagers under 20 years of age (USA, 1995).

Contraceptive method used	UNMARRIED			
	Lower economic status		Higher economic status	
	Not cohabiting	Cohabiting	Not cohabiting	Cohabiting
Pill	12.9	48.4	7.6	31.4
Condom	23.2	71.7	14.0	51.3

Źródło: H. Fu, J.E. Darroch, T. Haas, N. Ranjit, *Contraceptive Failure Rates: New Estimates From the 1995 National Survey of Family Growth*, in: “Family Planning Perspectives”, Vol. 31, Nr. 2, 1999, p. 56-63)

An analysis based on two consecutive American National Surveys of Family Growth (1995-2002) presents data on real effectiveness of individual contraceptive methods. The measure of effectiveness is the percentage of women who became pregnant within the first year of using a given method (considering typical use, usually of significantly lower effectiveness compared to perfect use assumed in surveys). Authors of the analysis assessed the risk of unplanned pregnancy within a year of using a given method for the following contraceptives: spermicides – 28%, condoms – 18%, contraceptive pills – 9%, Evra patches and NuvaRings – 9%, IUDs (considered as contraceptives in the survey) – 0.2% to 0.8% (according to the IUD type), methods based on fertility awareness – 24%. (J. Trussell, *Contraceptive failure in the United States*, in: „Contraception”, Vol. 83, 2011, p. 397-404)

The American National Survey of Family Growth performed by CDC in 2012 analysed data on 22,628 women and men aged 15-44 from 2006 to 2010. The data considered i.a. use of contraceptives. The study included calculated failure rate of individual contraceptive methods within 12 months of use. The rate was as follows: for condoms – 17.4%, for contraceptive pills – 8.7%, for injections – 6.7%. According to the study, 62% women of reproductive age used contraception at the time. (J. Jones, W. Mosher, K. Daniels, *Current Contraceptive Use in the United States, 2006-2010, and Changes in Patterns of Use Since 1995*, CDC, „National Health Statistics Reports”, Nr. 60, 2012, p. 1-26)

A research encompassed 166 sexually active teenagers aged between 12 and 18 who used various contraceptive methods or refused to use contraception at all (54 – implants, 64 – oral contraception, 48 – condoms with or without spermicides). The group was interviewed again after 6 months. The results showed various degrees of unreliability of contraception despite comparable degree of sexual activity among participants: one teenager with implants became pregnant (2%), the same as 13 users of oral contraception (20%) and 8 users of other contraceptive methods (17%). Within the

group, 30% teenagers fell victim to sexually transmitted diseases – STD rates were independent of contraceptive methods used. (L. Dinerman, M. Wilson, A. Duggan, A. Joffe, *Outcomes of Adolescents Using Levonorgestrel Implants vs Oral Contraceptives or Other Contraceptive Methods*, in: “Archives of Pediatrics & Adolescent Medicine”, Vol. 149, Nr. 9, 1995, p. 967-972)

The American National Survey of Family Growth 1995 and Abortion Patient Survey 1994-1995 focused on failure rate of contraception. The authors made an attempt to assess failure rates of individual contraceptive methods within the first 6 and 12 months of use. Their conclusion was that 47% underaged unmarried women cohabiting with their partner experience contraceptive failure. Fu, J.E. Darroch, T. Haas, N. Ranjit, *Contraceptive Failure Rates: New Estimates From the 1995 National Survey of Family Growth*, in: “Family Planning Perspectives”, Vol. 31, Nr. 2, 1999, p. 56-63)

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The British Medical Journal described a survey by a family planning clinic in Manchester: “52% of respondents had experienced condoms bursting or slipping off in the previous 3 months... We were surprised to find how commonly our clients had experienced ‘accidents’, even those who had apparently relied on condoms as their method of choice for contraception. It is routine practice to give clients information about the correct use of sheaths before their first prescription”. (J. Kelly, *Using condoms to prevent transmission of HIV*, in: “British Medical Journal”, Vol. 312, 1996, p. 1478)

“In the United States, 60% of all pregnancies, or 3.1 million per year, are unintended. Fortyseven percent of these unplanned pregnancies occur while women are using contraceptives. This high proportion is particularly surprising given the low pregnancy rates attributed to the long-term methods and the fact that oral contraceptives (...) are used by 73% of all United States contraceptors”, as shown by 53 articles on effectiveness of contraception. [Redactor’s note: In the United States unplanned pregnancies are defined as pregnancies planned by a couple but conceived without a pre-conception consultation]. (L.S. Potter, *How Effective Are Contraceptives? The Determination and Measurement of Pregnancy Rates*, in: “Obstetrics & Gynecology”, Vol. 88, Nr. 3 (Supplement), September 1996, p. 13S-23S).

The sixth edition of the American National Survey of Family Growth (2002-2003) analysed data on 7,643 women aged 15-44. The data served as a base for assessment of contraception failure rate. It was stated that within the first year of use, failure rate was as follows: for injections – 6.7%, for contraceptive pills – 8.7%, for condoms – 17.4%. A general failure property of contraceptives within different groups of women was assessed. For instance, among women under 20 years of age, failure rate within the first year of use was 13.1%, and in women over 30 years of age – 8.2%. Women living in poverty showed risk of unwanted pregnancy at the level of 19.9%, whereas women of higher socioeconomic status – 8.4%. Women cohabiting with their partners showed the risk at 21.7%, as opposed to 9.5% in the group of formerly married women. (K. Kost, S. Singh, B. Vaughan, J. Trussell, A. Bankole *Estimates of contraceptive failure from the 2002 National Survey of Family Growth*, in: „Contraception”, Vol. 77, Nr. 1, 2008, p. 10–21)

“During a lifetime of use of reversible methods, the typical woman will experience 1.8 contraceptive failures”, as supported by data provided by Princeton University within a cohort study of 10,847 women aged 15-44. (J. Trussell, B. Vaughan, *Contraceptive Failure, Method-Related Discontinuation*

And Resumption of Use: Results from the 1995 National Survey of Family Growth, in: „Family Planning Perspectives”, Vol. 31, Nr. 2, 1999, p. 64-72 & 93)

The typical woman will experience 1.8 contraceptive failures during a lifetime of use of reversible methods.

What are the mechanisms behind contraceptive failure?

In a cohort study performed in Michigan, 1,250 women aged 18-19 were asked to weekly fill in a specially prepared diary for 30 months, including i.a. consistency of contraceptive use. After the experiment was finished, participants sent over their diaries. Their analysis allowed to state that 28.3% diaries included reports on inconsistent use of contraceptives within the last week. (C. Moreau, K. Hall, J. Trussell, J. Barber, *Effect of prospectively measured pregnancy intentions indicators on the consistency of contraceptive use among young women in the U.S.*, in: „Human Reproduction”, Vol. 28, Nr. 3, 2013, p. 642-650)

A pilot study programme conducted in 13 research centres funded by Kaiser Family Foundation in San Diego based on 248 female participants who were given “morning-after” pills. 235 women used the pills. Over two thirds (70%) used contraceptives even before they were given the pills – 73% of the subgroup used condoms and 17% contraceptive pills. Their context reasons for unprotected intercourse were i.a.: burst or slipped condom (45%), forgot to use contraception (9%). The survey showed as well that 81% of the women experienced at least one side effect of using “morning-after” pills: sleepiness – 47.7%, vertigo – 20.4%, nausea after the first dose – 34.9%, nausea after the second dose – 33.6%, haemorrhage – 12.8%, headache – 11.9%, contractions – 14%. (S.M. Harvey, L.J. Beckman, Ch. Sherman, D. Petitti, *Women’s Experience and Satisfaction with Emergency Contraception*, in: „Family Planning Perspectives”, Vol. 18, Nr. 5, 1999, p. 237-240 & 260)

In 1995, American scientists in cooperation with Thai researchers conducted a survey among clients of prostitutes in the Lamphun province. Out of 7,594 condoms used during 4,743 client visits, 1.8% showed damage. The authors quote an earlier study that showed the rate between 1% and 12% in developed countries and considerably higher in developing ones. The same researchers had showed a 5.9% damage rate in an earlier study involving 5,559 condoms. (R. Sungwal, B. Chris, T. Sodsai, et al., *Multiple Condom Use and Decreased Condom Breakage and Slippage in Thailand*, in: *Journal of Acquired Immune Deficiency Syndromes & Human Retrovirology*”, Vol. 14, nr 2, 1997, p. 169-173)

A magazine published by Johns Hopkins University in Baltimore included an overview of studies on condom breakage during its use. For instance, an American survey performed over 6 weeks in 1990 on 45 men showed 7% rate of condom damage. An analogical Danish research that involved 40 men and women, including commercial sex workers, showed the rate at a level of 5%. Another research, conducted over three months in Barbados (46 men) and St. Lucia (36 men) showed the rate at a level of 12% and 10%. (L. Liskin, C. Wharton, R. Blackburn, P. Kestelman, *Population Report. Condoms – Now More Than Ever*, in: “Barrier Method”, Series H, nr 8, 1990, s. 1-12)

“A three-month prospective study of 103 women initiating oral contraceptive use examined how consistently the women took their pills and whether those who missed pills employed other means to

avoid pregnancy. Electronic devices were used to monitor the use of contraceptives. The results showed that 52% took each active pill or never missed more than one pill at a time after the first week of the initial cycle, another 21% were protected by behaviors that reduce the risk of pregnancy when two or more consecutive pills have been missed: avoiding coitus for the next 7 days (18%) or using backup contraception during that period (3%). The remaining 27% were at increased risk of pregnancy. (D. Oakley, L. Potter, E. de Leon-Wong, C. Visness, *Oral Contraceptive Use and Protective Behavior After Missed Pills*, in: "Family Planning Perspectives", Vol. 29, Nr. 6, 1997, p. 277-279)

Data analysis of 141 adult female oral contraception (OC) users performed in 1993-1994 showed that over the three research months, 68.1% participants missed one or more pills and 48.9% – two or more. The authors conclude: "unintended pregnancy due to inconsistent OC use remains a significant health care problem in the United States". The participants provided i.a. the following reasons for missed pills: away from home – 12.9%, forgot – 12.9%, no new pill pack – 10.5%, late – 9.95%, travel – 9.41%, work pressure – 8.06%, school pressure – 4.3%. The authors quote statistics on failure rate of pills in the first year of use. The rate, according to various sources, remains within the range of 3% to 20%. (J.D. Smith, D. Oakley, *Why Do Women Miss Oral Contraceptive Pills? Analysis of Women's Self-Described Reasons for Missed Pills*, in: "Journal of Midwifery and Women's Health", Vol. 50, 2005, p. 380-385)

In 2008-2009, 103 patients of Planned Parenthood clinic in Boston took part in a survey. The method was to send a text message to women using oral hormonal contraception that would remind them to take the next pill. As it turned out, the reminder did not influence habits of the participants and they forgot to take pills on an average of 4.7 times per cycle (the average number of missed pills within a cycle for the intervention group: 4.9 +/- 3.0, for the controls: 4.6 +/- 3.5). What is worth mentioning, all women participating in the survey considered regular taking of pills as the most important preventive action against unwanted pregnancy and marked it "10/10" on the importance scale. The researchers quote other sources that provide information that 20% out of 3.5 million unwanted pregnancies that occur annually in the United States are consequent to improper use of contraceptives. They also point out that in many surveys underestimate the real rate of improper use of contraceptives. (M.Y. Hou, S. Hurwitz, E. Kavanagh, et al., *Using Daily Text-Message Reminders to Improve Adherence With Oral Contraceptives. A Randomized Controlled Trial*, in: "Obstetrics & Gynecology", Vol. 111, 2010, p. 633-40)

Among research papers focused on inconsistent use of contraceptive pills by women, there is a vital analysis by American researchers that compared missed pills in a cycle declared by women with readings of electronic devices. It showed that only 45% reports of research participants on missed pills were true to the readings of electronic monitoring (the research group comprised of 103 patients of university medical clinics and public family planning clinics, monitored for three months). Each month, the proportion of women who declared no missed pills was considerably higher than relevant data from electronic monitoring (53-59% women declared no missed pills, compared to 19-33% from the monitoring). Percentage of "at least three pills missed" in the monitoring was three times higher than the declared percent (30-51% vs. 10-14%). The authors present data on pregnancy rate during use of oral contraceptives obtained from family planning clinics: it varies from 16 to 40%, according to the subgroup of women. (L. Potter, D. Oakley, E. de Leon-Wong, R. Canamar, *Measuring Compliance Among Oral Contraceptive Users*, in: "Family Planning Perspectives", Vol. 28, 1996, p. 154-158)

An analysis conducted in the United States based on data from 99% retail pharmacies and encompassed 780,000 unique prescribers and over 160,000,000 unique patients. The base served to isolate data on prescribed oral contraceptives for the years 2003-2004. The analysis was performed on data of almost 3,000,000 women. The researchers wanted to estimate what percentage of women who use hormonal

contraception refills their supplies consistently. As it turned out, only 16.3-34.5% women refilled their prescriptions on a timely basis within the 12 research months. The authors concluded that such a low rate means that only a small percentage of women had the potential for correct and consistent contraceptive use. Moreover, they underline the need to routinely provide condoms and emergency contraception to women initiating hormonal contraception. (A.L. Nelson, C. Westhoff, S.M. Schnare, *Real-World Patterns of Prescription Refills for Branded Hormonal Contraceptives*, in: "Obstetrics & Gynecology", Vol. 112, Nr. 4, 2008, p. 782-787)

A cohort survey on quality of hormonal contraception usage has been conducted on 27,028 Spanish women. Inconsistent use of contraceptives was stated in 71% users of contraceptive pills, in 32% users of patches and 21.6% users of vaginal rings. More than a half of participants reported emotional discomfort and anxiety about pregnancy protection. (I. Lete, J.L. Doval, E. Pérez-Campos, et al., *Self-described impact of noncompliance among users of a combined hormonal contraceptive method*, in: "Contraception", Vol. 77, 2008, p. 276-282)

Inconsistent use of contraceptives was stated in 71% users of contraceptive pills, 32% patch users and 21.6% ring users.

An article published in the Contraception magazine showed increased risk of contraceptive failure in obese women. The research that served as a base for the article showed that 11.9% women with highest BMI became pregnant unintended within the first year of using oral contraception. (J. Trussell, E.B. Schwarz, K. Guthrie, *Obesity oraz oral contraceptive pill failure*, in: „Contraception”, Vol. 79, 2009, p. 334-338)

Similarly, a meta-analysis of seven cohort studies that included 40,000 women in total provided data that women with BMI of or over 25 who used complex oral contraceptives showed increased pregnancy risk (by 1.91 times) compared to women with BMI lower than 25. (L.M. Lopez, D.A. Grimes, M. Chen-Mok, et. al., *Hormonal Contraceptives for Contraception in Overweight or Obese Women*, in: „Obstetrics & Gynecology”, Vol. 116, Nr. 5, November 2010)

Is it possible to estimate costs of contraceptive failure?

Medical costs of unplanned pregnancies resulting from improper use of contraceptives in the USA alone are over 2 billion dollars per year. Medical cost of all unplanned pregnancies in the country was estimated at 4.6 billion dollars annually, therein 53% expenses related to contraceptive failure. (J. Trussell, N. Henry, F. Hassan, et. Al., *Burden of unintended pregnancy in the United States: potential savings with increased use of long-acting reversible contraception*, in: „Contraception”, Vol. 87, 2013, p. 154-161)

An American cohort survey performed in 1995-1996 on 943 female users of oral hormonal contraception showed that 47% missed one or more pills per cycle and 22% missed two or more pills per cycle. The survey showed as well that within the two months of study 22% users called the provider of the pills due to side effects that occurred as a consequence of the method and 9% users had at least one medical consultation due to the problem. The authors estimate that the women expended an average of 25-62 dollars to treat the side effects. "Unintended pregnancies following pill discontinuation and compliance

difficulties are estimated to account for 20% of the 3.5 million annual unintended pregnancies in the United States, with associated costs of \$2.6 billion". (M.J. Rosenberg, M.S. Waugh, M.S. Burnhill, *Compliance, Counseling and Satisfaction with Oral Contraceptives: A Prospective Evaluation*, in: „Family Planning Perspectives”, Vol. 30, Nr. 2, 1998)

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