

# Increased Condom Use without Other Major Changes in Sexual Behavior among the General Population in Switzerland

## ABSTRACT

**Objectives.** This study is part of a continuous evaluation of the Swiss AIDS prevention strategy from 1987 through 1994.

**Methods.** Annual telephone surveys of samples representative of the general population aged 17 through 45 years have been conducted since 1987 to monitor behavioral change.

**Results.** No major changes in level of sexual activity (lifetime number of partners, frequency of sexual encounters in the past week) or potential exposure to risk of HIV transmission (acquisition of a new steady partner during the year or of casual partners in the last 6 months) were observed. Systematic condom use with a new steady partner increased between 1988 and 1994, from 40% to 64% among 17- to 30-year-olds and from 57% to 72% among those aged 31 to 45. Systematic condom use with casual partners increased from 8% to 56% between 1987 and 1994 among 17- to 30-year-olds and from 22% to 42% between 1989 and 1994 among those aged 31 to 45. Condom use was higher among those with multiple partners.

**Conclusions.** A general-population approach to AIDS prevention was able to achieve large-scale improvements in condom-based protection against HIV infection without inducing other major changes in sexual behavior. (*Am J Public Health*. 1997;87:558-566).

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### Introduction

Since the beginning of the acquired immunodeficiency syndrome (AIDS) epidemic, primary prevention has been identified as the most important weapon against the spread of the disease. The debate over the best prevention strategy continues to center on the focus of prevention (a population-based approach vs a high-risk-groups approach), on the choice of message (strategies centered on avoidance of exposure, including postponement or limitation of sexual activity; condom promotion; compulsory testing and partner notification, and so forth) and on ethical aspects (solidarity, discrimination, moral education, etc.).<sup>1-10</sup> In the United States, the debate concerning sexual education and condom promotion for adolescents has been particularly vigorous.<sup>11</sup> Condom promotion is regarded by some as ineffective and as encouraging early and promiscuous sexual activity. A statement on condom availability for adolescents was only recently issued by the American Academy of Pediatrics.<sup>12</sup> Evaluation of prevention activities has been strongly advocated,<sup>13-15</sup> and various approaches have been proposed.<sup>16-18</sup> However, to date, few developed countries have undertaken a systematic evaluation of their overall AIDS prevention activities.<sup>19</sup>

This article presents the results of the continuous monitoring of AIDS-related knowledge, attitudes, and behaviors in the general population of Switzerland. This monitoring, based on telephone surveys repeated since 1987, is part of the overall evaluation of the national population-based AIDS prevention strategy.

### Context

In 1994, Switzerland was one of the European countries most seriously affected by AIDS, with a cumulated rate of 586 reported AIDS cases per million inhabitants.<sup>20</sup> By the end of 1994, the number of reported cases of AIDS had risen to 2879.<sup>21</sup> Since 1992, the annual number of positive tests for human immunodeficiency virus (HIV) infection has declined, with 1405 positive tests declared in 1994.<sup>21</sup>

The percentages of reported AIDS cases accounted for by homosexuals and drug users changed slightly, from 39.1% and 39.3%, respectively, in 1989 to 34.8% and 41.6% in 1994, while the proportion accounted for by heterosexuals increased from 13.4% in 1989 to 23.9% in 1994. Meanwhile, the proportion of AIDS patients who were female increased gradually, from 17.7% in 1987 to 24.5% in 1994.<sup>21</sup>

In 1985, the Federal Office of Public Health developed a global policy for combating AIDS that included primary prevention of HIV infection, access to treatment, and promotion of solidarity.<sup>22</sup> The primary prevention strategy was introduced throughout the country in 1986 and provides for three levels of intervention<sup>23</sup>:

- Measures addressed to the general population (e.g., an information brochure

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distributed to all households in 1986, and the STOP AIDS campaigns organized at regular intervals since 1987). These measures sought to provide accurate information about HIV transmission; to promote condom use outside stable monogamous relationships; to encourage those who are faithful to stay so; and to encourage solidarity with people with HIV/AIDS.

- Measures aimed at specific target groups (e.g., adolescents, drug users, homosexuals). These measures convey appropriate messages via specialized organizations, peer groups, and the like.

- In-depth measures over the longer term, based on individual interaction (counseling, passing on information). These measures depend on potential mediators of prevention (e.g., doctors, parents, teachers) who need to be motivated, trained, and supported.

In 1987, the Lausanne University Institute of Social and Preventive Medicine was commissioned to carry out an ongoing evaluation of the strategy. A comprehensive and user-focused<sup>24,25</sup> approach was adopted, covering the processes and outcomes of preventive measures as well as relevant factors in the social environment. The evaluation methodology has been described elsewhere.<sup>26,27</sup> A system of key process and outcome indicators was devised to detect and measure the evolution of attitudes and behavioral changes occurring in different segments of the population.<sup>28</sup>

## Methods

A baseline telephone survey of the general population aged between 17 and 45 years living in Switzerland was carried out in January 1987, before the first national AIDS campaign started. The same survey was repeated annually from October 1987 to October 1992 and now is conducted biennially. (Until 1988, only persons aged 17 through 30 were monitored.)

The sampling procedure is carried out in two phases: (1) A simple random sample of household addresses is drawn from the Swiss official telephone directory in CD-ROM format. The addresses are then shuffled to ensure that no interviewer is allocated a whole series of interviews in the same region. (2) On calling, the interviewer selects individuals within households according to age and sex quotas based on census data. Various techniques are used to ensure that people who are normally difficult to reach are

**TABLE 1—Main Indicators Used in Annual and Biennial Monitoring of AIDS Knowledge and Prevention: General Population, Switzerland, 1987 through 1994**

Indicator	Survey Question
HIV/AIDS knowledge	Can you mention ways of protecting oneself against AIDS? (Spontaneous answers to an open precoded question with interviewer probing)
Fear of AIDS	Are you sometimes afraid of contracting AIDS? (Yes/rather yes/rather no/no)
Proximity of AIDS	Do you know someone (among your relatives, friends, school or work colleagues) who suffers from AIDS or who is seropositive? (No; yes, one person; yes, several persons)
Sexual activity	
Lifetime number of partners	Overall, how many people have you had sex with in your life?
Frequency of sexual intercourse during the last 7 days	How many times did you have sexual intercourse in the last 7 days?
Potential exposure to risk of HIV transmission	
No. casual partners in the last 6 months	Did you ever have casual sex with someone (outside the stable partner)? (Yes/no) (If yes) With how many people in the last 6 months?
Occurrence of change of steady partner or new steady partner in the current year (9 months)	Did you, this year, change your steady partner or did you have a new steady partner? (Yes/no)
Lifetime drug use	Have you ever used drugs? (Yes/no) (If yes) 1, soft drugs/2, hard drugs/3, both (If hard drugs) Have you ever injected drugs? (Yes/no)
Protection	
Condom use with casual partners in the last 6 months	(If respondent had a casual partner in the last 6 months) Did you use condoms in these situations? (Always/sometimes/never)
Condom use with the new steady partner in the current year	(If respondent had a new steady partner in the current year) Did you use condoms with your steady partner, perhaps only at the beginning of the relationship? (Yes/no)
Condom use during the latest sexual encounter	Did you use condoms the last time you had sexual intercourse? (Yes/no)
Possible unintentional side effects of condom promotion (sex at a young age: proportion sexually active at the age of 17)	At what age did you have your first sexual intercourse?

included in the final sample. A total of three attempts are made to reach the selected respondent, with calls at different times on different days; an appointment to interview an absent person is arranged with help from another member of the household; for teenagers or young adults who have recently left home, the new address is obtained and the interview conducted there. The mean refusal rate for the last three surveys was 12.5%.

In 1987 and 1988, the samples included 1200 people from the two main

linguistic areas of Switzerland (800 from the German-speaking area, 400 from the French-speaking area), with the French-speaking area overrepresented to reach statistical power in interregional comparisons. (In 1994, 72% of the population lived in the German-speaking area, 23% in the French-speaking area, and 5% in the Italian-speaking area.) Since 1989, the size of the sample has doubled with the inclusion of persons aged 31 through 45 years. Since 1991, the Italian-speaking area has been included, and it is also

**TABLE 2—Knowledge and Beliefs about HIV/AIDS: Percentages of Respondents Spontaneously Mentioning Possible Protective Measures Against AIDS\*: General Population, Switzerland, 1987 through 1994**

	Jan 1987	Oct 1987	Oct 1988	Oct 1989	Oct 1990	Oct 1991	Oct 1992	Oct 1994	P*
Age 17–30 y	n = 1182	n = 1211	n = 1211	n = 1231	n = 1227	n = 1427	n = 1426	n = 1378	
Age 31–45 y	...	...	...	n = 1177	n = 1174	n = 1371	n = 1374	n = 1425	
Using condoms									
Age 17–30 y	62 ± 3	82 ± 2	92 ± 2	92 ± 2	91 ± 2	91 ± 1	93 ± 1	95 ± 1	.000
Age 31–45 y	...	...	...	87 ± 2	86 ± 2	88 ± 2	88 ± 2	92 ± 1	.000
Practicing abstinence									
Age 17–30 y	11 ± 2	9 ± 2	17 ± 2	11 ± 2	17 ± 2	11 ± 2	12 ± 2	17 ± 2	.000
Age 31–45 y	...	...	...	13 ± 2	17 ± 2	13 ± 2	16 ± 2	19 ± 2	.000
Using clean syringes									
Age 17–30 y	18 ± 2	28 ± 3	25 ± 2	14 ± 2	16 ± 2	18 ± 2	16 ± 2	15 ± 2	.000
Age 31–45 y	...	...	...	8 ± 2	9 ± 2	9 ± 2	7 ± 1	6 ± 1	.005
Being faithful									
Age 17–30 y	18 ± 2	38 ± 3	48 ± 3	49 ± 3	37 ± 3	37 ± 3	27 ± 2	27 ± 2	.000
Age 31–45 y	...	...	...	59 ± 3	44 ± 3	41 ± 3	38 ± 3	35 ± 2	.000
Limiting no. of partners									
Age 17–30 y	...	...	...	...	...	7 ± 1	7 ± 1	4 ± 1	.000
Age 31–45 y	...	...	...	...	...	6 ± 1	6 ± 1	4 ± 1	.010
Getting tested									
Age 17–30 y	2 ± 1	3 ± 1	3 ± 1	3 ± 1	3 ± 1	4 ± 1	3 ± 1	4 ± 1	.006
Age 31–45 y	...	...	...	2 ± 1	1 ± .6	3 ± 1	2 ± 1	3 ± 1	.019
Avoiding transfusions									
Age 17–30 y	6 ± 1	4 ± 1	6 ± 1	4 ± 1	5 ± 1	6 ± 1	5 ± 1	4 ± 1	.249
Age 31–45 y	...	...	...	2 ± 1	3 ± 1	4 ± 1	4 ± 1	4 ± 1	.006
Using care in choosing a partner									
Age 17–30 y	42 ± 3	35 ± 3	25 ± 2	16 ± 2	15 ± 2	13 ± 2	9 ± 1	8 ± 1	.000
Age 31–45 y	...	...	...	15 ± 2	15 ± 2	12 ± 2	9 ± 2	8 ± 1	.000
Having no homosexual contacts									
Age 17–30 y	12 ± 2	7 ± 1	2 ± 1	2 ± 1	1 ± .5	3 ± 1	2 ± 1	1 ± .5	.000
Age 31–45 y	...	...	...	1 ± .6	1 ± .6	2 ± 1	1 ± .5	1 ± .5	.708
Using caution in everyday life									
Age 17–30 y	3 ± 1	5 ± 1	3 ± 1	2 ± 1	2 ± 1	2 ± 1	2 ± 1	2 ± 1	.000
Age 31–45 y	...	...	...	2 ± 1	3 ± 1	2 ± 1	1 ± .5	2 ± 1	.215
Avoiding people with AIDS									
Age 17–30 y	1 ± .6	2 ± 1	0	1 ± .5	1 ± .5	2 ± 1	1 ± .5	0	.037
Age 31–45 y	...	...	...	1 ± .6	1 ± .6	1 ± .5	1 ± .5	0	.001

Note. Percentages are rounded off and given with 95% confidence interval computed by normal approximation.

\*In response to the question, "Can you mention ways of protecting oneself against AIDS?"

\*χ<sup>2</sup> for trend.

overrepresented; the total sample is now 2800. Data are weighted according to regional representativeness.

The annual telephone survey, carried out by the IPSO polling institute, uses a computer-assisted telephone interviewing technique with a standardized questionnaire evaluating knowledge on HIV transmission and prevention, relational status, risk situations with a potential for infec-

tion, and condom use in different situations. The survey does not contain questions about sexual practices. The average length of an interview has varied between 10 and 14 minutes according to the year of the survey because batches of questions on specific topics are added to the core questionnaire and changed each year. The nonresponse rate on sensitive questions has remained low, ranging in the last three

waves from 2.5% to 5.6% for lifetime number of partners and from 0.2% to 0.5% for experience of sexual intercourse with casual partners.

The questionnaire has basically retained the structure of the baseline survey of January 1987. To permit the observation of trends, the wording of the questions has been maintained. The questions are carefully designed to allow the respon-

dent to answer without anyone nearby overhearing personal information; they are formulated in such a way that the answers do not need to contain elements that could embarrass the respondent.

The main indicators used are presented in Table 1. Some of these indicators have also been incorporated into other Swiss surveys to allow comparison of data. Several cross-checks have allowed assessment of the validity and reliability of the method used. For example, in 1992, using a cluster sample of schools and a self-administered questionnaire, a health survey of Swiss adolescents found similar proportions of behaviors with potential exposure to HIV infection and almost identical levels of protection.<sup>29</sup> The 1992 survey was used to calculate population estimates of the number of people tested in anonymous testing centers, and these estimates were found to be very close to the statistics compiled by both the Swiss Red Cross (in charge of blood donation in Switzerland) and the centers themselves.<sup>30</sup> A reliability and validity study of the 1992 telephone survey was undertaken by face-to-face reinterview of a subsample of survey respondents aged 17 to 22. The results<sup>31</sup> show that the reliability of the data is good, but that protection that is reported as regular ("always using condoms") may, in fact, include "exceptional" occasions of nonuse.

Following the evaluation of the distribution of an information leaflet to all households in Switzerland that had shown high levels of knowledge in 1986,<sup>32</sup> it was decided to use spontaneous replies to an open question, rather than answers to closed items, as indicators of knowledge on prevention measures. In addition, it was felt that the answers to an open question would more accurately reflect the relative importance attributed by the respondents to different means of protection (effective or ineffective) and allow tracking of the possible emergence of fear or discrimination.

Very conservative indicators of potential exposure to risk (a new stable partner during the year of the survey and the number of casual partners during the 6 months prior to the survey) were chosen in order to capture all people who at least once during these periods were in the situation of having to think about AIDS prevention and to take action accordingly.

Trends were ascertained by means of the Mantel-Haenszel chi-square test for linear association<sup>33</sup>; only the corresponding *P* values are reported in the tables and in the text.

**TABLE 3—Median Number of Sexual Partners throughout a Lifetime, by Age and Sex: General Population, Switzerland, 1987 through 1994**

	Jan 1987	Oct 1987	Oct 1988	Oct 1989	Oct 1990	Oct 1991	Oct 1992	Oct 1994
<b>Age 17–30 y</b>								
Men	4	4	4	3	3	3	3	4
Women	2	2	2	2	2	2	2	2
Total	3	3	3	2	2	3	2	3
<b>Age 31–45 y</b>								
Men	...	...	...	6	6	6	6	7
Women	...	...	...	3	3	3	3	3
Total	...	...	...	5	5	5	5	5

## Results

The sociodemographic characteristics of the samples have been stable over the years: for example, in 1994, 9% ± 1% of the 17- to 30-year-olds had a low level of education, 68% ± 2% had a medium level, and 23% ± 2% had a high level, vs 11% ± 2%, 69% ± 3%, and 20% ± 2% in 1987.

### Knowledge and Beliefs about AIDS

Changes in knowledge and beliefs about HIV/AIDS are documented in Table 2. The responses fall into three broad categories: effective means of protection (such as using condoms or practicing abstinence), actions that in themselves do not necessarily constitute protection (such as taking the HIV antibody test or being faithful), and responses indicating that the respondent's knowledge of HIV transmission is inaccurate and/or implying a potential for stigmatizing social groups (such as using caution in everyday life or avoiding people with AIDS).

The proportions of respondents mentioning effective means of protection illustrate a sharp contrast between 1987 and 1994. Condoms were widely and increasingly mentioned as a protective measure by both age groups. Abstinence was more frequently mentioned in 1994, and clean syringes less, by both age groups.

Measures that in themselves are not protective were mentioned infrequently by both age groups. The exception is fidelity, which was mentioned more often by younger people in 1994 than at baseline, but there appears to be a decreasing trend since 1990 in both age groups. Limiting the number of partners was mentioned somewhat less often in 1994, whereas getting tested and avoiding transfusions (for older people) were mentioned slightly more often.

With regard to erroneous or stigmatizing beliefs, both age groups show a common pattern: either a marked decrease (for using care in choosing partners and having no homosexual contacts) or stability at a very low level (for using caution in everyday life and avoiding people with AIDS).

### Fear of and Proximity of AIDS

The proportion of people who are sometimes afraid of contracting HIV/AIDS increased among the 17- to 30-year-old age group, from 24% in 1987 to 29% in 1994 ( $\chi^2$  for trend,  $P \equiv .000$ ), but not among older people (18% in 1989 and 17% in 1994). The growth of the epidemic is reflected in the significant increase ( $\chi^2$  for trend,  $P \equiv .000$  in both age categories) in the proportion of respondents who know someone affected by HIV/AIDS, from 13% in 1987 to 24% in 1994 among the 17- to 30-year-olds and from 13% in 1989 to 27% in 1994 among the 31- to 45-year-olds.

### Sexual Activity

Two indicators of sexual activity are described here: the median number of sexual partners in a person's lifetime and the number of sexual acts in the preceding 7 days. The first of these indicators is a cumulative figure and thus less sensitive to short-term variations. The frequency of sexual intercourse during the preceding 7 days is a direct indicator of sexual activity and reflects current fluctuations.

The median number of partners in a person's lifetime remained stable from 1987 to 1994 (Table 3). Among the youngest respondents (17 through 20 years old), there seems to be the beginning of a trend toward fewer partners, but the proportion of sexually active people remained stable (Table 4). The proportion of people who had never had a partner

**TABLE 4—Distribution (%) of Lifetime Number of Partners: Respondents Aged 17 through 20 Years, Switzerland, 1987 through 1994**

No. Partners	Jan 1987 (n = 344)	Oct 1987 (n = 353)	Oct 1988 (n = 353)	Oct 1989 (n = 428)	Oct 1990 (n = 422)	Oct 1991 (n = 484)	Oct 1992 (n = 492)	Oct 1994 (n = 328)
0	34 ± 5	32 ± 5	32 ± 5	32 ± 4	32 ± 4	30 ± 4	35 ± 4	34 ± 5
1	20 ± 4	22 ± 4	23 ± 4	30 ± 4	26 ± 4	25 ± 4	24 ± 4	27 ± 5
2	10 ± 3	11 ± 3	13 ± 3	10 ± 3	10 ± 3	14 ± 3	11 ± 3	14 ± 4
3+	33 ± 5	26 ± 5	31 ± 5	26 ± 4	25 ± 4	27 ± 4	29 ± 4	25 ± 5
Nonresponse	3	9	1	2	7	4	1	0

Note. Percentages are rounded off and given with 95% confidence interval computed by normal approximation.  $\chi^2$  for trend:  $P = .009$ .

**TABLE 5—Indicators (%) of Potential Exposure to Risk of Infection with HIV, by Age Group: General Population, Switzerland, 1987 through 1994**

	Jan 1987	Oct 1987	Oct 1988	Oct 1989	Oct 1990	Oct 1991	Oct 1992	Oct 1994	$P^*$
<b>All respondents</b>									
Age 17–30 y	n = 1182	n = 1211	n = 1213	n = 1231	n = 1227	n = 1426	n = 1427	n = 1378	
Age 31–45 y	...	...	...	n = 1177	n = 1175	n = 1371	n = 1374	n = 1425	
<b>New steady partner<sup>a</sup></b>									
Age 17–30 y	...	...	20 ± 2	15 ± 2	17 ± 2	14 ± 2	15 ± 2	14 ± 2	.000
Age 31–45 y	...	...	...	4 ± 1	3 ± 1	4 ± 1	4 ± 1	4 ± 1	.548
<b>One or more casual partners<sup>b</sup></b>									
Age 17–30 y	18 ± 2	14 ± 2	15 ± 2	15 ± 2	12 ± 2	15 ± 2	14 ± 2	13 ± 2	.003
Age 31–45 y	...	...	...	9 ± 2	10 ± 2	10 ± 2	8 ± 1	9 ± 2	.462
<b>Intravenous drug use<sup>c</sup></b>									
Age 17–30 y	1	<1	1	1	1	1	1	1	.997
Age 31–45 y	...	...	...	>1	1	1	1	1	.916
<b>Men only</b>									
Age 17–30 y	n = 591	n = 605	n = 605	n = 624	n = 623	n = 728	n = 722	n = 714	
Age 31–45 y	...	...	...	n = 601	n = 597	n = 696	n = 701	n = 733	
<b>Contact with prostitutes<sup>b</sup></b>									
Age 17–30 y	2 ± 1	1 ± .6	1 ± .6	2 ± 1	2 ± 1	3 ± 1	2 ± 1	2 ± 1	.160
Age 31–45 y	...	...	...	1 ± .5	1 ± .5	2 ± 1	2 ± 1	3 ± 1	.002
<b>Homosexual contacts<sup>c</sup></b>									
Age 17–30 y	3 ± 1	3 ± 1	2 ± 1	4 ± 1	6 ± 1	5 ± 2	4 ± 1	3 ± 1	.245
Age 31–45 y	...	...	...	3 ± 1	5 ± 2	5 ± 2	5 ± 2	2 ± 1	.124

Note. Percentages are rounded off and given with 95% confidence interval computed by normal approximation.

<sup>a</sup>During the year.

<sup>b</sup>During the previous 6 months.

<sup>c</sup>During lifetime.

\* $\chi^2$  for trend.

fluctuated between 11% and 16% in the 17- to 30-year-old group and remained at 1% in the 31- to 45-year-old group. The proportion of people who had had 10 or more partners also remained stable at between 15% and 18% in the younger group and between 29% and 33% in the older group.

There was also no significant change in the frequency of sexual encounters in

the 7 days preceding the interview. Between 1989 and 1994, among those aged 17 through 30 years, 40% to 44% had not had sex, 12% to 15% had had sex once, and 38% to 42% had had sex twice or more (1% to 3% were nonresponders). Among those aged 31 through 45 years, 28% to 31% had not had sex in the preceding 7 days, 16% to 18% had had sex once, and 46% to 50% had had sex

twice or more (2% to 3% were nonresponders).

*Potential Exposure to Risk of HIV Infection*

Table 5 summarizes the evolution of indicators of potential exposure to risk of HIV infection. There was no significant change in these indicators in the 31- to 45-year-old group, except for the in-

TABLE 6—Condom Use (%), by Age Group: General Population, Switzerland, 1987 through 1994

	Jan 1987	Oct 1987	Oct 1988	Oct 1989	Oct 1990	Oct 1991	Oct 1992	Oct 1994	<i>P</i> *
Use with casual partners in the last 6 months									
Age 17–30 y									
Always	8 ± 4	17 ± 6	36 ± 7	48 ± 7	48 ± 8	52 ± 7	60 ± 7	56 ± 7	.000
Sometimes	25 ± 6	45 ± 8	48 ± 7	20 ± 6	19 ± 6	21 ± 5	19 ± 5	23 ± 6	
Never	67 ± 6	38 ± 7	16 ± 5	32 ± 7	34 ± 8	27 ± 6	21 ± 6	21 ± 6	
Age 31–45 y									
Always	...	...	...	22 ± 8	35 ± 9	37 ± 8	52 ± 9	42 ± 8	.000
Sometimes	...	...	...	16 ± 7	8 ± 5	18 ± 6	15 ± 7	13 ± 6	
Never	...	...	...	62 ± 9	57 ± 9	45 ± 8	33 ± 9	45 ± 8	
Use with new steady partner in the current year									
Age 17–30 y	...	...	40 ± 6	52 ± 7	55 ± 7	57 ± 7	66 ± 6	64 ± 7	.000
Age 31–45 y	...	...	...	57 ± 14	55 ± 16	54 ± 14	68 ± 12	72 ± 12	.034
Use during latest sexual encounter									
Age 17–30 y	...	...	...	...	...	31 ± 3	32 ± 3	39 ± 3	.000
Age 31–45 y	...	...	...	...	...	14 ± 2	16 ± 2	22 ± 2	.000

Note. Percentages are rounded off and given with 95% confidence interval computed by normal approximation.  
\* $\chi^2$  for trend.

creased frequency of contacts with prostitutes (the question is asked of men only). In the 17- to 30-year-old group, on the other hand, there was a decrease in the number of people with a new steady partner during the year of the survey, from 20% in 1987 to 14% in 1994. The proportion of people with one or more casual partners during the preceding 6 months also decreased slightly, from 18% in 1987 to 13% in 1994. The distribution of the number of casual partners during the preceding 6 months remained stable in both age groups (data not shown).

The indicators of potential exposure to risk of infection show some differences between men and women, the latter group consistently reporting a lower frequency for these indicators. For instance, in 1994, 23% ± 2% of the women and 36% ± 3% of the men reported that they had ever had a casual partner. The median lifetime number of partners was three for women and five for men.

### Condom Use

Several aspects of the use of condoms as protection against HIV transmission are monitored by the survey: use with casual partners in the last 6 months, use

with a new steady partner in the current year, and use during the latest sexual encounter (Table 6).

While the proportion of people who had casual partners remained stable, consistent condom use ("always") as a means of protection against the risk of infection with HIV during casual sex increased considerably between 1987 and 1994, from 8% to 56% in the 17- to 30-year-old group and from 22% to 42% in the 31- to 45-year-old group. Overall, trends in condom use are similar for all age groups (Figure 1). Specifically, condom use was most common in the youngest age group (among the 17- to 20-year-olds, consistent condom use increased from 16% in 1987 to 69% in 1994), and there seems to be a generation effect: use was more frequent among 21- to 25-year-olds in 1990 than among 17- to 20-year-olds in 1987.

Condom use was also more common among people with multiple partners. In the 17- to 30-year-old group, consistent condom use increased from 4% in 1987 to 50% in 1994 among respondents reporting one casual partner during the 6 months prior to the interview, and from 11% in 1987 to 61% in 1994 among those

reporting two or more casual partners. In the 31- to 45-year-old group, the increase was from 15% in 1989 to 27% in 1994 for those with one partner and from 40% in 1989 to 67% in 1994 for those with two or more partners (data not shown).

Between 1988 and 1994, there was an increase from 40% to 64% in the use of condoms with a new steady partner in the 17- to 30-year-old group; in the 31- to 45-year-old group, the increase, marginally significant, was from 57% in 1989 to 72% in 1994. The figures are thus slightly higher than those for condom use with casual partners.

The use of condoms during the latest sexual encounter was first recorded in 1991. The overall rate of use has increased since then and is now twice as high in the younger age group. In addition, condom use during the latest sexual encounter differs according to type of risk (defined here as one or more casual partners in the past 6 months, a new steady partner during the year, contact with prostitutes in the past 6 months, and use of intravenous drugs). On the basis of the 1992 data, we found that 43% of those (of all ages) who had been exposed to at least one of these risks had used a condom during their

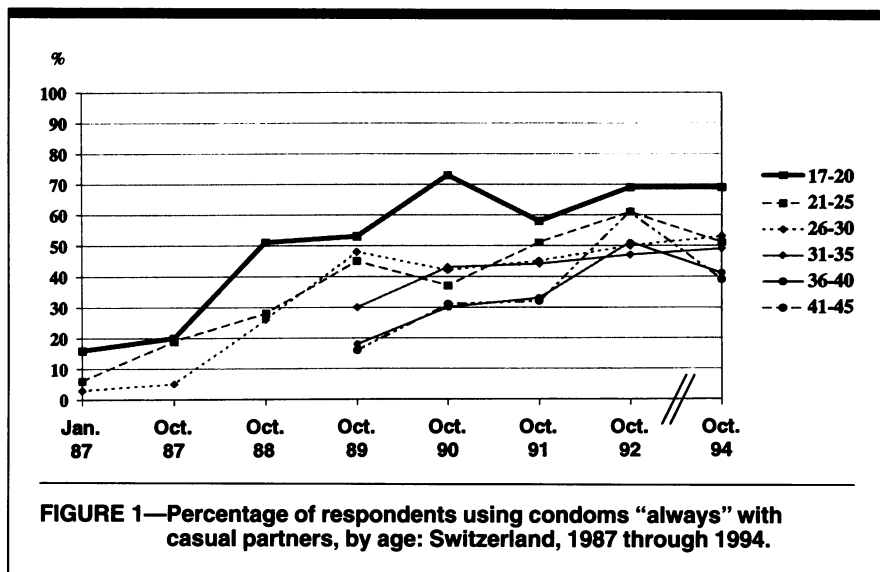


FIGURE 1—Percentage of respondents using condoms "always" with casual partners, by age: Switzerland, 1987 through 1994.

latest sexual encounter vs 16% among those who had not had such exposure.

It has already been mentioned that women generally report a lower frequency of potential exposure to risk than do men. The same applies to the use of condoms in such situations, except with a new steady partner, where the difference is not statistically significant: in 1994, 37%  $\pm$  9% of women and 57%  $\pm$  7% of men consistently used condoms with a casual partner; 61%  $\pm$  9% and 71%  $\pm$  8%, respectively, with a new steady partner; and 21%  $\pm$  2% and 30%  $\pm$  3%, respectively, during the latest sexual encounter.

## Discussion

Telephone surveys to obtain data on sexual behavior have been widely used (in the United States,<sup>34</sup> France,<sup>35,36</sup> Scotland,<sup>37</sup> Germany,<sup>38</sup> and Belgium<sup>39</sup>) and are generally accepted as a useful and valid method.<sup>40,41</sup> In particular, no difference has been found between telephone and face-to-face interviews in the answers to questions about numbers of partners and condom use.<sup>42</sup> Fewer than 10% of Swiss households do not have a telephone, and young people, foreign nationals, and single and divorced people are more likely to fall into this category.<sup>43</sup>

Three salient points arise from this 8-year monitoring of AIDS-related knowledge, attitudes, and behavior in the general population of Switzerland: (1) a high degree of knowledge about AIDS prevention has been attained without development of fear or stigmatization; (2) consistent trends in behavioral change resulting in encouraging levels of condom use have been obtained; and (3) no major

changes have occurred regarding sexual activity or exposure to risk of HIV transmission.

Knowledge of condoms as an effective measure of protection is high in Switzerland, as it is elsewhere.<sup>34,44-47</sup> Inappropriate means of prevention are very rarely mentioned by survey respondents. Appropriate protective measures are increasingly mentioned and are always mentioned more than avoidance measures in specific domains (e.g., using condoms rather than abstinence or avoiding contacts with prostitutes or homosexuals, using clean syringes rather than avoiding drug use). This realistic and nonmoralistic approach to life may reflect the priorities of the prevention strategy, which has carefully avoided arousing fear or prescribing lifestyles. Emphasis was put on solidarity and on the possibility of keeping the risk of infection under control with proper personal protection. Overreaction to the AIDS epidemic did not occur. In spite of an increasing proximity to AIDS, the increase in the proportion of people who are sometimes afraid of contracting AIDS was small and was restricted to the 17- to 30-year-old age group.

Switzerland's AIDS prevention strategy does not seem to have modified the overall level of sexual activity, at least when number of partners or frequency of sexual acts is considered. Similar trends were observed in Germany<sup>38</sup> during the same period. There is no evidence of a change in the distribution of number of partners in Switzerland, except in adolescents. Furthermore, a secondary analysis of studies conducted between 1971 and 1993 on the sexual behavior of Swiss

adolescents showed that the long-term trend toward an increase in the proportion of adolescents who were sexually active at 17 years (also observed in the United States<sup>48</sup>) was reversed by the end of the 1980s,<sup>49</sup> that is, after the beginning of the national AIDS campaign and the generalization of sex education in schools. A review of sex education programs conducted by the World Health Organization<sup>50</sup> and other studies<sup>51,52</sup> also concluded that neither sex education nor condom promotion leads to earlier or increased sexual activity among adolescents.

Indicators of the level of potential exposure to risk of HIV transmission also remained stable in the general population. Among the younger adults (aged 17 through 30 years), a slow decrease was observed in the proportion of people with casual partners during the 6 months preceding the surveys and in the proportion of those with a new steady partner during the year of the survey. The available data do not allow us to ascribe a specific cause to the latter, such as an increase in the average duration of these relationships or an increase in the duration of periods without a steady partner. Nonetheless, these data show that a nonnegligible part of the general population is regularly exposed to such situations, indicating a potential for transmission if HIV prevalence were to increase in the general population: a serious justification for continuing large-scale prevention efforts. Direct comparison with other European countries (France,<sup>53</sup> Belgium,<sup>39</sup> Sweden,<sup>54</sup> Great Britain<sup>55(pp 94-97)</sup> or the United States is not possible because the time intervals asked about (generally 1 year or 30 days) and the wording of the questions are different. The European and US figures are nevertheless of the same magnitude (around 10% of the population aged 15 through 50 years having had more than one partner during the last year). The same systematic gender differences in number of partners as well as in condom use are found in our surveys as in the other studies cited, and the explanations generally suggested—sampling bias, reporting bias, age differential in couples<sup>55(pp 101-102)</sup>—may also apply in this case.

A rapid and large increase in condom use in all these situations was observed in all age groups in Switzerland. This increase stands in contrast to the relative stability of the indicators of sexual activity and potential exposure to risk of transmission, which were not targets of

the prevention strategy. Condom use increased more among the younger generations and those more exposed (people with multiple casual partners and those who reported one or more situations of potential exposure). We can therefore assume that use of condoms is generally relevant. The trend in reported condom use in Switzerland is also mirrored in the trend in condom sales: statistics from the distributors of the main condom brands (representing more than 80% of the Swiss market) show a regular increase in wholesale deliveries,<sup>28</sup> from 7.62 million items in 1986 to 15.98 million in 1994.

In Switzerland, AIDS prevention advertising targeted to the general population and specific groups has been widespread and continuous since 1987 and has been complemented by sex education and AIDS prevention efforts in schools. The mass media have been multipliers of prevention information, generally avoiding sensationalism and globally keeping in line with the prevention policies of the national and regional administrations.<sup>58</sup> This unanimity in the discourse on AIDS may have created a social desirability bias in the answers of respondents to the surveys. However, such a bias would mainly affect the level of the indicators, not the trends, the consistency of which is the main finding. The observed levels of condom use have nonetheless been confirmed in other studies carried out at the same time and using different modes of inquiry, mainly among young people.<sup>29,52</sup>

Higher levels of lifetime experience with condoms in the younger generation have also been found in several European countries<sup>59</sup> and in the United States.<sup>60</sup> An increase in condom use in the general population or at least among the younger part of it has been observed in France,<sup>44</sup> Germany,<sup>38</sup> the Netherlands,<sup>46</sup> Scotland,<sup>61</sup> Sweden,<sup>54</sup> the United Kingdom,<sup>55(pp 373-374)</sup> and the United States.<sup>60</sup> However, the size of the behavioral change is generally lower in those countries than in Switzerland. This difference may be due to the globality, intensity, continuity, and high degree of consensus that characterize the Swiss AIDS prevention strategy.<sup>62</sup>

Behavioral changes and stabilization of HIV prevalence have been observed in Switzerland in other target groups, such as homosexual and bisexual men<sup>63,64</sup> and intravenous drug users.<sup>65,66</sup> It can therefore be said that the overall level of risk taking has decreased and that a certain "safety net" exists that should help prevent not only the rapid propagation of

AIDS/HIV but also any more insidious, underground development of the epidemic in the general population. Whether this decrease will be sufficient to bring about a significant and sustainable decrease in the transmission of HIV is not yet known, and further research is needed to investigate in more depth the connections between different subgroups of the population and the networks of transmission of the virus.

These results show the feasibility and utility of an open general population approach<sup>67</sup> in a country with a relatively high HIV prevalence. They should also reassure those who fear that widespread sex education and condom promotion increase the level of sexual activity and promiscuity among youth in particular. □

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### References

1. Brandt AM. *No Magic Bullet: A Social History of Venereal Disease in the United States since 1880*. New York, NY: Oxford University Press; 1985.
2. Osborne JE. AIDS: politics and science. *Prev Med*. 1990;19:744-751.
3. Angell M. A dual approach to the AIDS epidemic. *N Engl J Med*. 1991;342:1498-1500.
4. Bayer R. Public health policy and the AIDS epidemic: an end to HIV exceptionalism. *N Engl J Med*. 1991;342:1500-1504.
5. Rogers DE, Osborne J. Another approach to the AIDS epidemic. *N Engl J Med*. 1991;325:806-808.
6. Ehrhardt AA. Editorial: trends in sexual behavior and the HIV pandemic. *Am J Public Health*. 1992;82:1459-1461.
7. Rogers DE, Osborne J. AIDS policy: two divisive issues. *JAMA*. 1993;270:2436-2437.
8. Des Jarlais DC, Padian NS, Winkelstein W. Targeted HIV prevention programs. *N Engl J Med*. 1994;331:1451-1453.
9. Wallace R, Fullilove M, Fullilove R, Gould P, Wallace D. Will AIDS be contained within US minority urban populations? *Soc Sci Med*. 1994;39:1051-1062.
10. Genuis SJ, Genuis SK. Adolescent sexual involvement: time for primary prevention. *Lancet*. 1995;345:240-241.
11. Blendon RJ, Donelan K, Knox RA. Public opinion and AIDS: lessons for the second decade. *JAMA*. 1992;267:981-986.
12. American Academy of Pediatrics, Commit-

- tee on Adolescence. Condom availability for youth. *Pediatrics*. 1995;95:281-285.
13. Becker MH. AIDS and behavioral change to reduce risk: a review. *Am J Public Health*. 1988;78:394-410.
14. Fineberg HV. Education to prevent AIDS, prospects and obstacles. *Science*. 1988;239:592-596.
15. Nelkin D. AIDS and the social sciences: review of useful knowledge and research needs. *Rev Infect Dis*. 1987;8:980-986.
16. Coyle S, Boruch R, Turner C, eds. *Evaluating AIDS Prevention Programs*. Washington, DC: National Academy Press; 1989.
17. Hahn RA. What should behavioural scientists be doing about AIDS? *Soc Sci Med*. 1991;33:1-3. Foreword.
18. Mertens T, Caraël M, Sato P, et al. Prevention indicators for evaluating the progress of national AIDS programs. *AIDS*. 1994;8:1359-1369.
19. Dubois-Arber F, Paccaud F. Assessing AIDS/HIV prevention: what do we know in Europe? *Soz Praventivmed*. 1994;3(7 suppl 1):3-13.
20. WHO-EC Collaborating Centre on AIDS. *AIDS surveillance in Europe, Surveillance du sida en Europe, update at 30 Sept. 1994*. Quarterly Report on AIDS Surveillance in Europe. Saint-Maurice, France; 1994; no. 43.
21. VIH et sida en Suisse jusqu'à la fin de 1994. *Bulletin de l'Office fédéral de la santé publique (Berne)*. 1995;76(3):4-9.
22. Somaini B. Grundlagen des AIDS/HIV-Prävention. In: Jäger H, ed. *AIDS und HIV-Infektionen. Diagnostik, Klinik, Behandlung: Handbuch und Atlas für Klinik und Praxis*. Landsberg, Germany: Ecomed; 1989:1-18.
23. *Le SIDA en Suisse: l'épidémie, ses conséquences et les mesures prises*. Berne, Switzerland: Office fédéral de la santé publique, Commission de contrôle de la recherche sur le sida; 1989.
24. Rossi PH, Freeman HE. *Evaluation, a Systematic Approach*. 4th ed. Newbury Park, Calif: Sage Publications; 1989.
25. Patton MQ. *Utilization-Focused Evaluation*. 2nd ed. Newbury Park, Calif: Sage Publications; 1987.
26. Dubois-Arber F, Lehmann P, Hausser D. Towards improved action against AIDS. *World Health Forum*. 1988;9:376-381.
27. Dubois-Arber F, Jeannin A, Meystre-Agustoni G, Gruet F, Paccaud F. *Evaluation of the AIDS Prevention Strategy in Switzerland: Fourth Assessment Report 1991-1992*. Lausanne, Switzerland: Institut universitaire de médecine sociale et préventive; 1993. Cah Rech Doc IUMSP, no. 82b.
28. Dubois-Arber F, Jeannin A, Konings E. Evaluation of the Swiss AIDS prevention strategy: establishing a system of indicators allowing the monitoring of activities and the assessment of results. In: Friedrich D, Heckmann W, eds. *AIDS in Europe: The Behavioural Aspects*. Vol. 4. Berlin, Germany: Sigma; 1995:143-151.
29. Narring F, Tschumper A, Michaud PA, et al. *La santé des adolescents en Suisse: rapport d'une enquête nationale sur la santé et les styles de vie des 15-20 ans*. Lausanne, Switzerland: Institut universi-



- taire de médecine sociale et préventive; 1994. Cah Rech Doc IUMSP, no. 113a.
30. Jeannin A, Dubois-Arber F, Paccaud F. HIV testing in Switzerland. *AIDS*. 1994;8:1599-1603.
  31. Jeannin A, Dubois-Arber F, Konings E, Hausser D. Estimation of the impact of inaccuracy in reporting the number of sexual partners and condom use. Presented at the European Conference on Methods and Results of Psycho-social AIDS-Research: AIDS in Europe—The Behavioural Aspect; September 26-29, 1994; Berlin, Germany.
  32. Lehmann P, Hausser D, Somaini B, Gutzwiller F. Campaign against AIDS in Switzerland: evaluation of a nationwide educational programme. *BMJ*. 1987;295:1118-1120.
  33. Chi-squared tests with 1 degree of freedom: extensions of the Mantel-Haenszel procedure. *J Am Stat Assoc*. 1963;58:690-700.
  34. Catania JA, Coates TJ, Stall R, et al. Prevalence of AIDS-related risk factors and condom use in the United States. *Science*. 1992;258:1101-1106.
  35. Spira A, Bajos N, Béjin A, et al. (Groupe ACSF). *Les comportements sexuels en France: rapport au Ministère de la recherche et de l'espace*. Paris, France: La Documentation Française; 1993. Collection des rapports officiels.
  36. Moatti JP, Dab W, Pollak M, et al. Les attitudes et comportements des Français face au sida. *La Recherche (Paris)*. 1990; 223:888-895.
  37. McQueen D, Uitenbroek D. Condom use and concern about AIDS. *Health Educ Res*. 1992;7:47-53.
  38. Bundeszentrale für gesundheitliche Aufklärung. *AIDS im öffentlichen Bewusstsein der Bundesrepublik*. Köln, Germany: BGA; 1993.
  39. Hubert M, Marquet J. *Comportements sexuels et réactions au risque du SIDA en Belgique: rapport*. Bruxelles, Belgium: Commission des Communautés Européennes (DG-V); 1993.
  40. Fife-Schaw CR, Breakwell GM. Estimating sexual behaviour parameters in the light of AIDS: a review of recent UK studies of young people. *AIDS Care*. 1992;4:187-201.
  41. Catania JA, Gibson DR, Chitwood DD, Coates TJ. Methodological problems in AIDS behavioral research: influences on measurement error and participation bias in studies in sexual behavior. *Psychol Bull*. 1990;108:339-362.
  42. ACSF Investigators and Associates. Analysis of sexual behavior in France (ACSF): a comparison between two modes of investigation: telephone survey and face-to-face survey. *AIDS*. 1992;6:315-323.
  43. Wietlisbach V, Hausser D, Barazzoni F, Rickenbach M. Enquête MONICA: analyse de la participation. *Soz Präventivmed*. 1987;32:63-68.
  44. *Evaluer la prévention du sida en France: un inventaire des données disponibles*. Paris, France: Agence nationale de recherche sur le sida, Agence française de lutte contre le sida; 1992.
  45. Tikkanen J, Koskela K. A five years follow-up study of attitudes to HIV infection among Finns. *Health Promotion Int*. 1992;7:3-9.
  46. De Vroome EMM, Paalman MEM, Sandfort TGM. AIDS in the Netherlands: the effects of several years of campaigning. *Int J STD AIDS*. 1990;1:268-275.
  47. Hardy AM. AIDS knowledge and attitudes for January-March 1991. *Adv Data Vital Health Stat*. Aug 21, 1992; no. 216:1-5. DHHS Publication DHS 92-1250.
  48. Centers for Disease Control and Prevention. Premarital sexual experience among adolescent women, United States, 1970-1988. *MMWR Morb Mortal Wkly Rep*. 1991;39:929-932.
  49. Koffi-Blanchard MC, Dubois-Arber F, Michaud P-A, Narring F, Paccaud F. Hat sich der Beginn der Sexualität bei Jugendlichen in der Zeit von Aids verändert? *Schweiz Med Wochenschr*. 1994;124:1047-1055.
  50. Baldo M, Aggleton P, Slutkin G. Does sex education lead to earlier or increased sexual activity in youth? In: Abstracts of the Ninth International Conference on AIDS and Fourth STD World Congress; June 6-11, 1993. Berlin, Germany: Institute for Clinical and Experimental Virology of the Free University of Berlin; 1993;2:792. Poster no. DO2 3444.
  51. Sellers D, McGraw SA, McKinlay JB. Does the promotion and distribution of condoms increase teen sexual activity? Evidence from an HIV prevention program for Latino youth. *Am J Public Health*. 1994;84:1952-1958.
  52. Hausser D, Michaud PA. Does a condom-promoting strategy (the Swiss STOP-AIDS campaign) modify sexual behavior among adolescents? *Pediatrics*. 1994;93:580-585.
  53. ACSF Investigators. AIDS and sexual behaviour in France. *Nature*. 1992;360:407-410.
  54. Herlitz C. Sexual behaviour in the general population of Sweden. *Soc Sci Med*. 1993;36:1535-1540.
  55. Wellings K, Field J, Johnson AM, Wadsworth J. *Sexual Behaviour in Britain*. London, England: Penguin Books; 1994: 94-97.
  56. Leigh BC, Temple MT, Trocki KF. The sexual behavior of US adults: results from a national survey. *Am J Public Health*. 1993;83:1400-1408.
  57. Kyung-Hee C, Catania JA, Dolcini MM. Extramarital sex and HIV risk behavior among US adults: results from the National AIDS Behavioral Survey. *Am J Public Health*. 1994;84:2003-2007.
  58. Daverio C. *Sida media: Analyse de la presse écrite 1988-1990*. Lausanne, Switzerland: Institut universitaire de médecine sociale et préventive; 1992. Cah Rech Doc IUMSP, no. 52.12.
  59. Dubois-Arber F, Spencer B. Condom use. In: Bajos N, Hubert M, Sandfort T, eds. *Sexual Behaviour and HIV/AIDS in Europe: Comparisons of National Surveys*. London, Bristol PA: Taylor & Francis. In press.
  60. Centers for Disease Control and Prevention. Trends in sexual behavior among high school students, United States, 1990, 1991, and 1993. *MMWR Morb Mortal Wkly Rep*. 1995;44:124-132.
  61. Robertson BJ. Sexual behaviour and risk of exposure to HIV among 18-25-year-olds in Scotland: assessing change 1988-1993. *AIDS*. 1995;9:285-292.
  62. Kocher KW. *The Stop Aids Story 1987-1992*. Basel, Switzerland: Morf, 1993.
  63. Dubois-Arber F, Masur J-B, Hausser D, Zimmermann E, Paccaud F. Evaluation of AIDS prevention among homosexual and bisexual men in Switzerland. *Soc Sci Med*. 1993;37:1539-1544.
  64. Bochow M, Chiarotti F, Davies P, et al. Sexual behaviour of gay and bisexual men in eight European countries. *AIDS Care*. 1994;6:533-549.
  65. Dubois-Arber F, Konings E, Koffi-Blanchard M, Gervasoni J-P, Hausser D. Evaluating HIV prevention of low-threshold needle exchange programmes in Switzerland. In: Friedrich D, Heckmann W, eds. *AIDS in Europe: The Behavioural Aspects*. Vol. 4. Berlin, Germany: Sigma; 1995:183-189.
  66. Cattaneo M, Dubois-Arber F, Leuthold A, Paccaud F. *Evaluation of the Federal Measures to Reduce the Problems Related to Drug Use. Phase I. Initial Report 1990-1992*. Lausanne, Switzerland: Institut universitaire de médecine sociale et préventive; 1993. Cah Rech Doc IUMSP, no. 81.
  67. Rose G. *The Strategy of Preventive Medicine*. New York, NY: Oxford University Press; 1992.