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Risk and Protective Factors and Trends Over Time in Initiation of Sexual Intercourse among Adolescents, Rakai District, Uganda, 1994-2011

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Short Abstract

Initiation of sexual intercourse places young people at immediate risk of HIV, other STIs, and unintended pregnancy. We examined data from adolescents (15-19 years) in the Rakai Community Cohort Study, Uganda, using logistic regression to assess factors associated with ever having sexual intercourse. Sexual experience rose for young men in the 1990s and then declined after 2003 for adolescent men and women (quadratic trend, $p < .0001$ for adolescent men adjusted for age). Sexual initiation was associated with not being enrolled in school, being a single or double orphan, alcohol use in the past 30 days, and religious affiliation. Over time, dramatic increases occurred in school enrollment and sizeable declines were found for entrance into marriage and in single and double orphanhood. Trends in sexual initiation among youth in Rakai appears to be strongly influenced by social factors such as increasing access to education and declining orphanhood.

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Background:

Initiation of sexual intercourse is both a key social developmental transition and an important risk factor for HIV, other STIs, and unintended pregnancy. A broad variety of biological, individual, and social factors influence sexual initiation among youth including pubertal timing, personal resilience, poverty, family factors, peer influences, educational and occupational opportunities for young people, and connectedness to social institutions (Kirby, Mavenzenge, Mmari). Prior research has identified the transition to sexual experience as an important developmental milestone in relationship and family formation and childbearing (Bongaarts). Many adolescents become pregnant in the first years after sexual initiation, particularly in countries where access to contraception is limited (Zabin) and Bongaarts has identified age at first union and first coitus as key predictors of adolescent and national fertility. Likewise, acquisition of many STIs, particularly HPV and HSV-2, often occur soon after sexual initiation. Globally, 40% of HIV infections are estimated to occur to young people under the age of 25 (UNAIDS). Age at initiation or the proportion of adolescents who are sexually experienced is commonly measured in demographic surveys such as the Demographic and Health Surveys and the National Survey of Family Growth. Finally, delaying initiation of sexual intercourse before marriage has been an objective of national programs to prevent HIV and unintended pregnancy among young people.

In another study we found a remarkable decline in HIV acquisition among adolescent women associated with rising school enrollment and delays in marriage and in initiation of sexual intercourse (Santelli et al). This study explored trends over time in sexual experience, risk and protective factors for initiating sex, and how trends in these factors influenced trends in sexual experience.

Methods:

We examined trends and risk factors for initiation of sexual intercourse among adolescents 15-19 years using quantitative data from the Rakai Community Cohort Study (RCCS), Uganda between 1994-2011 (rounds 1-14). Data came from questionnaires administered to adolescents and a household census form completed by the head of household. Initial analyses included youth 20-24 years however sexual experience was relatively high beyond age 20, so this older group was excluded. All analyses were stratified by gender.

The Rakai Community Cohort Study (RCCS) is an open cohort of residents 15-49 years in the Rakai District of southwestern Uganda; it has been described elsewhere (Wawer 1998,1999). Communities are surveyed approximately annually, with 43 communities under continual surveillance between 1994 and 2011. Institutional review board (IRB) approvals for the current analysis and RCCS were obtained from Uganda Virus Research Institute's Science and Ethics Committee, Uganda National Council for Science and Technology, and from IRBs at Columbia University and Johns Hopkins University, and Western IRB.

At each survey round, participants are consented, interviewed and asked to provide biological specimens for HIV and STI testing. For minors (< 18 years), minor assent and

parental/guardian written consent for research participation is obtained. Face-to-face interviews are conducted in private locations by same-sex interviewers. Questionnaires include questions on demographic, behavioral, reproductive and health characteristics. The RCCS achieves over 85% coverage among all residents. Among consenting participants, 99% respond to the full questionnaire and over 90% agree to specimen collection.

Since 2000, the Rakai Health Sciences Program has implemented interventions to prevent maternal to child transmission (2000), anti-retroviral treatment (2004), and male circumcision (MC) (2007). MC was implemented as a service program after a successful randomized clinical trial from 2003-2007 (Gray). Uganda expanded access to universal primary education beginning in 1997 by abolishing tuition fees for primary education (Deininger). In 2007, Uganda instituted a policy of universal secondary education; secondary school admission is restricted to those who pass national entrance examinations.

Statistical analysis:

Sexual experience, defined as the proportion population reporting ever having had sexual intercourse, was calculated by RCCS survey round (Table 1). We also examined the distributions of risk and protective factors by survey round (Table 2).

Next, we explored factors associated with initiating sexual intercourse (Tables 3 and 4). The sample was limited to adolescents who had at least one prior interview where they reported no sexual experience. Once an adolescent reported sexual experience subsequent observations on that respondent were censored. Data were examined separately for women and men.

Associations were assessed using logistic regression. For bivariate and multivariate tests of association, we report p-values adjusted by single year of age given the observed change in the age structure over time (see Table 1 and Figures 1 and 2). Among men, the proportion of older adolescents (18-19 year olds) increased from round 1 to round 8 (with some variation) and then declined from round 9 to 14. Among women, the proportion of older adolescents (18-19 year olds) increased from round 1 to round 9 and then declined from round 10 to 14.

For these analyses, we examined the following potential risk and protective factors; age, school enrollment, residency (rural areas or trading villages), single and double orphanhood, marriage, socioeconomic status, religious affiliation, tribal affiliation, and circumcision status among young men.

Results:

Figures 3 and 4 show the incidence of adolescents reporting sexual experience by survey round and age. Sexual initiation rose for young men through round 8 and then declined steadily through R14. Among adolescent women, sexual experience was relatively flat from Round 1 to 8 and then declined.

Table 1 describes the distribution of risk factors in the population of adolescents by survey round between 1994 and 2011. Other notable changes included dramatic increases in school enrollment (see also Figures 5 and 6) and sizeable declines were found for marriage (see also Figures 7 and 8) and in single and double orphanhood for both young men and young women. (Figures 5-8 stratify school enrollment and marriage by single year of age.) Alcohol use in the past 30 days also increased among adolescent men and women. Circumcision, although not monitored at every round, rose from round 8 to 14. Rounds 8-14 includes the period of time for the randomized trial of adult surgical circumcision and subsequent rollout in Rakai as a prevention service.

Given changes in the age structure of the population, we also explored sexual experience by risk factors and single year of age (Table 2). For example, sexual experience was lower at every age between 15 and 19 among those currently enrolled in school; differences between students and those out of school were greater for young women.

Table 3 presents odds ratios for sexual experience adjusted for age alone. Risk factors for sexual initiation were similar for all adolescents and unmarried adolescents. Significant linear and quadratic factors demonstrate change over time, including rising and falling trends, for both men and women. Sexual experience was also associated with not being enrolled in school, being a single or double orphan, alcohol use, and religious affiliation. Adolescents reporting “saved or Pentecostal” religious affiliation – although a small group – were less likely to be sexually experienced. Sexual experience and circumcision status among adolescent men showed an association of borderline statistical significance (see also Figure 9).

Table 4 presents the results of our multivariate logistic regression analyses. Adjusting for other factors in the logistic model: age, school enrollment, alcohol use, and religion were associated with sexual experience for adolescent men and women. Linear and quadratic terms for time were significantly related to sexual experience only for adolescent men. Single and double orphanhood status was associated with sexual experience for adolescent women only.

Discussion:

Between 1994 and 2011, sexual experience among adolescents in Rakai increased among young men and then decreased among young men and women. At the same time, school enrollment increased dramatically, while sizeable declines were found for marriage and in single and double orphanhood. These social factors were strongly associated with reporting sexual experience. Likewise, change in these social factors was associated with change in sexual experience. Trends in sexual initiation among adolescents in Rakai appears to be strongly influenced by social factors such as increasing access to education and declining orphanhood. Increased enrollment in school occurred before and after national efforts to guarantee universal primary education which began in 2007; presumably this also reflects rising educational expectations among adolescent and parents. Declining orphanhood among adolescents in Rakai is presumably related to improved treatment for HIV/AIDS in Rakai over time.

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Table 1. Distribution of risk factors over time, Rakai Adolescent Men (15-19 years), 1994-2011

	R1	R2	R3	R4	R6	R7	R8	R9	R10	R11	R12	R13	R14	P-value
Currently in School														
No	0.6485	0.5008	0.5843	0.4977	0.5739	0.565	0.5298	0.4656	0.491	0.3975	0.4167	0.3883	0.3489	<0.0001
Yes	0.3515	0.4992	0.4157	0.5023	0.4261	0.435	0.4702	0.5344	0.509	0.6025	0.5833	0.6117	0.6511	
Ever married														
No	.	.	.	0.9337	0.9521	0.957	0.9669	0.9767	0.9769	0.9745	0.9802	0.9829	0.9922	<0.0001
Yes	.	.	.	0.0663	0.0479	0.043	0.0331	0.0233	0.0231	0.0255	0.0198	0.0171	0.0078	
Current married														
No	0.9549	0.9574	0.9566	0.9470	0.9546	0.9599	0.9711	0.9789	0.9795	0.9754	0.9856	0.9836	0.9935	<0.0001
Yes	0.0451	0.0426	0.0434	0.0530	0.0454	0.0401	0.0289	0.0211	0.0205	0.0246	0.0144	0.0164	0.0065	
Orphanhood status														
Both parents in hh	0.2132	0.2290	0.2430	0.2377	0.2469	0.2368	0.2448	0.3010	0.2888	0.3327	0.3608	0.3976	0.4120	<0.0001
Both parent dead	0.1783	0.1130	0.1544	0.1552	0.1674	0.2094	0.2100	0.2219	0.2067	0.1758	0.1442	0.1150	0.0922	
One parent dead	0.3329	0.3344	0.3179	0.3309	0.3289	0.3102	0.3087	0.3021	0.3068	0.2940	0.2860	0.2638	0.2426	
Other	0.2756	0.3237	0.2846	0.2762	0.2568	0.2436	0.2365	0.1750	0.1977	0.1975	0.2090	0.2236	0.2531	
SES														
High	0.2121	0.3069	0.2377	0.2367	0.2796	0.2671	0.3366	0.3367	0.3620	0.4008	0.4021	0.4007	0.4594	<0.0001
Middle	0.2340	0.2351	0.2541	0.2367	0.2572	0.2789	0.2514	0.2544	0.2798	0.2826	0.3153	0.3264	0.3271	
Low	0.5540	0.4580	0.5082	0.5266	0.4632	0.4540	0.4119	0.4089	0.3582	0.3166	0.2826	0.2729	0.2135	
Residence														
Rural	0.8212	0.8782	0.8670	0.8922	0.8043	0.8006	0.8149	0.8222	0.7897	0.8167	0.8395	0.8423	0.8436	0.0406
Trading village	0.1788	0.1218	0.1330	0.1078	0.1957	0.1994	0.1851	0.1778	0.2103	0.1833	0.1605	0.1577	0.1564	
Alcohol Use past 30 days														
No	0.6444	0.7002	0.6607	0.6979	0.7168	0.7009	0.7273	0.2670	0.2727	0.4038	0.2650	.	.	<0.0001
Yes	0.3556	0.2998	0.3393	0.3021	0.2832	0.2991	0.2727	0.7330	0.7273	0.5962	0.7350	.	.	
Circumcised														
No	0.8623	0.86	0.8586	0.8584	.	.	0.8329	0.7922	0.7936	0.794	0.7825	0.7209	0.6555	<0.0001
Yes	0.1377	0.14	0.1414	0.1416	.	.	0.1671	0.2078	0.2064	0.206	0.2175	0.2791	0.3445	
Religion														
Catholic	0.6547	0.6164	0.6269	0.6050	0.5962	0.5863	0.5972	0.5488	0.6147	0.5879	0.6023	0.5791	0.5900	<0.0001
Protestant	0.1967	0.2146	0.2164	0.2283	0.2130	0.2098	0.1991	0.1900	0.1586	0.1955	0.1579	0.1871	0.1697	
Saved (Pentecostal)	0.0086	0.0152	0.0119	0.0228	0.0297	0.0275	0.0327	0.0290	0.0283	0.0446	0.0491	0.0312	0.0319	
Muslim	0.1283	0.1309	0.1380	0.1324	0.1495	0.1627	0.1633	0.2164	0.1955	0.1614	0.1871	0.1954	0.1970	
Others	0.0047	0.0137	0.0051	0.0114	0.0058	0.0137	0.0062	0.0079	0.0028	0.0079	0.0035	0.0060	0.0091	
Tribe														
Muganda	0.8600	0.8944	0.8864	0.7949	0.8343	0.8403	0.8449	0.8763	0.8638	0.9016	0.8699	0.8752	0.8614	0.0213
Munyankole	0.0601	0.0497	0.0499	0.0862	0.0786	0.0798	0.0823	0.0618	0.0580	0.0412	0.0644	0.0514	0.0612	
Munyarwanda	0.0261	0.0233	0.0224	0.0420	0.0330	0.0339	0.0380	0.0215	0.0348	0.0293	0.0274	0.0416	0.0381	
Murundi	0.0198	0.0124	0.0103	0.0047	0.0127	0.0140	0.0063	0.0108	0.0087	0.0066	0.0143	0.0073	0.0219	
Mukiga	0.0111	0.0047	0.0103	0.0210	0.0169	0.0120	0.0127	0.0054	0.0145	0.0106	0.0060	0.0098	0.0023	
Mutanzenia	0.0229	0.0155	0.0207	0.0513	0.0245	0.0200	0.0158	0.0242	0.0203	0.0106	0.0179	0.0147	0.0150	

Table 1 Continued. Distribution of risk factors over time, Rakai Adolescent Women (15-19 years), 1994-2011

	R1	R2	R3	R4	R6	R7	R8	R9	R10	R11	R12	R13	R14	P-value
Currently in School														
No	0.7830	0.6943	0.6865	0.6936	0.7345	0.6990	0.6828	0.6445	0.6247	0.5297	0.4959	0.4331	0.4170	<0.0001
Yes	0.2170	0.3057	0.3135	0.3064	0.2655	0.3010	0.3172	0.3555	0.3753	0.4703	0.5041	0.5669	0.5830	
Marital status														
Never married	.	.	.	0.4811	0.5418	0.5574	0.5852	0.5959	0.6139	0.6984	0.7297	0.7645	0.7628	<0.0001
Devoiced	.	.	.	0.5189	0.4582	0.4426	0.4148	0.4041	0.3861	0.3016	0.2703	0.2355	0.2372	
Current married														
No	0.5388	0.5655	0.5306	0.5248	0.5588	0.5803	0.6137	0.6147	0.6291	0.7102	0.7352	0.7751	0.7754	<0.0001
Yes	0.4612	0.4345	0.4694	0.4752	0.4412	0.4197	0.3863	0.3853	0.3709	0.2898	0.2648	0.2249	0.2246	
Orphanhood status														
Both parents in hh	0.1281	0.1529	0.1443	0.1492	0.1603	0.1519	0.1693	0.2022	0.2046	0.2430	0.2791	0.3186	0.3316	<0.0001
Both parent dead	0.1483	0.1286	0.1386	0.1528	0.1677	0.1729	0.1681	0.1749	0.1778	0.1734	0.1489	0.1336	0.1055	
One parent dead	0.3225	0.3369	0.3215	0.3222	0.3070	0.3123	0.3125	0.2875	0.3065	0.2875	0.2722	0.2525	0.2319	
Other3	0.4011	0.3816	0.3956	0.3758	0.3650	0.3629	0.3501	0.3353	0.3110	0.2961	0.2998	0.2954	0.3310	
SES														
High	0.2323	0.2624	0.2426	0.2441	0.3169	0.3259	0.3499	0.3567	0.3655	0.4063	0.4435	0.4345	0.5060	<0.0001
Middle	0.2220	0.2557	0.2527	0.2505	0.2534	0.2636	0.2547	0.2773	0.3074	0.2977	0.3237	0.3469	0.3184	
Low	0.5457	0.4818	0.5047	0.5054	0.4296	0.4105	0.3954	0.3660	0.3271	0.2961	0.2328	0.2186	0.1756	
Residence														
Rural	0.8598	0.8478	0.8550	0.8938	0.7840	0.7790	0.8041	0.8176	0.7962	0.7992	0.8363	0.8458	0.8252	<0.0001
Trading village	0.1402	0.1522	0.1450	0.1062	0.2160	0.2210	0.1959	0.1824	0.2038	0.2008	0.1637	0.1542	0.1748	
Alcohol Use past 30 days														
No	0.7341	0.7607	0.7592	0.7918	0.7673	0.7718	0.7623	0.4221	0.4380	0.3760	0.4581	.	.	<0.0001
Yes	0.2659	0.2393	0.2408	0.2082	0.2327	0.2282	0.2377	0.5779	0.5620	0.6240	0.5419	.	.	
Circumcised														
No	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yes	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Religion														
Catholic	0.6120	0.6462	0.6062	0.5725	0.5952	0.6117	0.5906	0.5788	0.5617	0.6076	0.5469	0.5872	0.5636	<0.0001
Protestant	0.2023	0.1896	0.2085	0.2349	0.2229	0.2039	0.2090	0.1886	0.1930	0.1867	0.1983	0.1859	0.1780	
Saved (Pentecostal)	0.0115	0.0147	0.0233	0.0330	0.0210	0.0182	0.0203	0.0201	0.0574	0.0606	0.0517	0.0536	0.0612	
Muslim	0.1536	0.1362	0.1490	0.1523	0.1529	0.1597	0.1706	0.2051	0.1809	0.1415	0.1944	0.1639	0.1933	
Others	0.0109	0.0107	0.0104	0.0055	0.0063	0.0065	0.0085	0.0037	0.0052	0.0012	0.0077	0.0063	0.0019	
Tribe														
Muganda	0.8355	0.8234	0.8143	0.7694	0.7853	0.7976	0.7806	0.7813	0.7954	0.8015	0.7911	0.7998	0.8039	0.7570
Munyankole	0.0770	0.0829	0.0981	0.1078	0.1027	0.0754	0.0981	0.0916	0.1058	0.0907	0.1074	0.0969	0.1063	
Munyarwanda	0.0385	0.0380	0.0371	0.0454	0.0455	0.0476	0.0551	0.0467	0.0388	0.0490	0.0512	0.0549	0.0439	
Murundi	0.0111	0.0190	0.0146	0.0189	0.0158	0.0159	0.0110	0.0206	0.0159	0.0172	0.0167	0.0161	0.0234	
Mukiga	0.0131	0.0082	0.0080	0.0189	0.0117	0.0026	0.0121	0.0093	0.0071	0.0086	0.0138	0.0140	0.0068	
Mutanzania	0.0248	0.0285	0.0279	0.0397	0.0391	0.0608	0.0430	0.0505	0.0370	0.0331	0.0197	0.0183	0.0156	

Table 2. Proportion of Male Adolescents Who Have Ever Had Sex by Risk Factor and Age, Rakai, Uganda, 1994-2011 (R1-R14)

		15	16	17	18	19
Total N	12016	2278	2766	2405	2723	1844
	Row Totals	Pct	Pct	Pct	Pct	Pct
Currently in School						
No	5064	0.3837	0.4709	0.5706	0.6953	0.8046
Yes	6171	0.2208	0.2794	0.3646	0.4984	0.6007
Ever married						
No	8486	0.2482	0.3322	0.4428	0.5767	0.6791
Yes	263	1.0000	1.0000	1.0000	1.0000	1.0000
Current married						
No	11773	0.2595	0.3661	0.5057	0.6699	0.7890
Yes	242	1.0000	1.0000	1.0000	1.0000	1.0000
Orphanhood status						
Both parents in household	3473	0.2491	0.3068	0.3827	0.5193	0.5943
Both parent dead	1754	0.2857	0.4016	0.5112	0.6519	0.7889
One parent dead	3424	0.2805	0.3430	0.4613	0.5988	0.7114
Other	2812	0.2389	0.3220	0.4740	0.6686	0.7811
SES						
High	4020	0.2191	0.3155	0.4239	0.6118	0.7246
Middel	3321	0.2496	0.3383	0.4307	0.6003	0.7241
Low	4650	0.2932	0.3495	0.4778	0.6002	0.7169
Residence						
Rural	9997	0.2587	0.3406	0.4462	0.6006	0.7200
Trading village	2009	0.2416	0.3075	0.4507	0.6202	0.7281
Alcohol Use past 30 days						
No	4696	0.2537	0.3231	0.4185	0.5851	0.7191
Yes	2184	0.4235	0.4781	0.5807	0.7392	0.8290
Circumcised						
No	7442	0.2464	0.3368	0.4383	0.6064	0.7197
Yes	1792	0.2896	0.3390	0.4917	0.6093	0.7338
Religion						
Catholic	5523	0.2665	0.3529	0.4904	0.6900	0.7952
Protestant	1790	0.2063	0.3467	0.4936	0.6561	0.8068
Saved_p	257	0.2031	0.3621	0.4571	0.4746	0.6829
Muslim	1506	0.2805	0.3921	0.5159	0.6821	0.8152
Others	66	0.2500	0.2105	0.5455	0.5833	0.6250
Tribe						
Muganda	7776	0.2523	0.3579	0.4886	0.6726	0.7990
Munyankole	571	0.2870	0.3009	0.4490	0.6207	0.7300
Munyarwanda	283	0.1957	0.3881	0.6271	0.7377	0.7800
Murundi	115	0.2632	0.4688	0.5500	0.7692	0.7778
Mukiga	95	0.1905	0.4737	0.4375	0.7619	0.9999
Mutanzania	174	0.4146	0.4054	0.5313	0.6286	0.8276

Table 2 Continued. Proportion of Female Adolescents Who Have Ever Had Sex by Risk Factor and Age, Rakai, Uganda, 1994-2011 (R1-R14)

		15	16	17	18	19
Total N	14058	2748	3028	2754	3105	2423
	Row Totals	Pct	Pct	Pct	Pct	Pct
Currently in School						
No	7781	0.5399	0.7009	0.8359	0.9036	0.9464
Yes	5748	0.1981	0.2895	0.3521	0.4366	0.5271
Ever married						
No	7365	0.2554	0.3535	0.4599	0.5465	0.6562
Yes	4445	1.0000	1.0000	1.0000	1.0000	1.0000
Current married						
No	9770	0.2428	0.3897	0.5250	0.6671	0.8011
Yes	4286	1.0000	1.0000	1.0000	1.0000	1.0000
Orphanhood status						
Both parents in household	3149	0.1814	0.2865	0.3550	0.4365	0.5836
Both parent dead	1962	0.3744	0.4825	0.6750	0.8373	0.9053
One parent dead	3844	0.3212	0.4963	0.6696	0.7863	0.8598
Other	4378	0.3688	0.5720	0.7380	0.8687	0.9489
SES						
High	5073	0.2661	0.4265	0.5875	0.7368	0.8400
Middel	3879	0.2831	0.4267	0.6092	0.7713	0.8724
Low	5077	0.3284	0.4995	0.6568	0.8159	0.9116
Residence						
Rural	11536	0.2910	0.4521	0.6219	0.7757	0.8810
Trading village	2522	0.3052	0.4618	0.6100	0.7696	0.8473
Alcohol Use past 30 days						
No	6246	0.3153	0.4636	0.6268	0.7883	0.8772
Yes	2152	0.4323	0.6650	0.8144	0.8971	0.9620
Circumcised						
No	-	-	-	-	-	-
Yes	-	-	-	-	-	-
Religion						
Catholic	6969	0.2971	0.5360	0.7179	0.8622	0.9336
Protestant	2373	0.2763	0.4332	0.7020	0.8604	0.9367
Saved_p	397	0.1961	0.3291	0.5217	0.6235	0.8387
Muslim	1936	0.3397	0.5036	0.7120	0.8933	0.9438
Others	81	0.3158	0.3889	0.4286	0.5294	0.8000
Tribe						
Muganda	9202	0.2838	0.4843	0.6924	0.8490	0.9281
Munyankole	1105	0.2811	0.4688	0.7196	0.8599	0.9455
Munyarwanda	526	0.4054	0.6381	0.7312	0.8409	0.9426
Murundi	189	0.5294	0.6667	0.8065	0.8958	0.9355
Mukiga	122	0.4857	0.5294	0.7619	0.9231	0.8261
Mutanania	370	0.3846	0.7170	0.8226	0.9500	0.9870

Table 3. Odds of Ever Having Had Sexual among Rakai Male Adolescents 15-19 years, 1994-2011 (R1-R14) – Odds ratios Adjusted for Age

	N	Odds Ratio	95% Lower	95% Upper	P-value
Linear trend for round					
Rounds	12016	0.967	0.958	0.975	<0.0001
Quadric trend for round					
Rounds	12016	1.116	1.073	1.159	<0.0001
Rounds^2	12016	0.991	0.988	0.993	<0.0001
Current school					
Yes (ref)	5064	-	-	-	-
No	6171	2.342	2.156	2.544	<0.0001
Orphanhood status					
Both parents in household	3473	-	-	-	-
Both parent dead	1754	1.632	1.444	1.844	<0.0001
One parent dead	3424	1.313	1.187	1.452	<0.0001
Other	2812	1.438	1.293	1.600	<0.0001
SES					
High	4020	-	-	-	-
Median	3321	1.045	0.947	1.152	0.3816
Low	4650	1.137	1.040	1.244	0.0049
Locality					
Rural	9997	-	-	-	-
Trading village	2009	0.984	0.889	1.089	0.7530
Alcohol used in the past 30 days					
No	4696	-	-	-	-
Yes	2184	1.975	1.768	2.205	<0.0001
Circumcised					
No	7442	-	-	-	-
Yes	1792	1.105	0.991	1.233	0.0733
Religion					
Catholic	5523	-	-	-	-
Protestant	1790	0.908	0.809	1.020	0.1047
Saved/Pentecostal	257	0.663	0.502	0.875	0.0037
Muslim	1506	1.093	0.966	1.237	0.1580
Others	66	0.694	0.406	1.188	0.1833
Tribe					
Muganda	7766	-	-	-	-
Munyankole	571	0.843	0.700	1.015	0.0707
Munyarwand	283	1.194	0.923	1.545	0.1777
Murundi	115	1.338	0.897	1.996	0.1539
Mukiga	95	1.327	0.850	2.069	0.2129
Mutanzania	174	1.281	0.923	1.777	0.1388

Table 3 Continued. Odds of Ever Having Had Sexual among Rakai Female Adolescents 15-19 years, 1994-2011 (R1-R14) – Odds ratios Adjusted for Age

	N	Odds Ratio	95% Lower	95% Upper	P-value
Test for single risk factors (unadjusted)					
Rounds	14058	0.936	0.928	0.944	<0.0001
Quadric trend for round					
Rounds	14058	1.074	1.034	1.115	0.0002
Rounds^2	14058	0.991	0.989	0.993	<0.0001
Current school					
Yes (ref)	7781	-	-	-	-
No	5748	7.792	7.148	8.493	<0.0001
Orphanhood status					
Both parents in household	3149	-	-	-	-
Both parent dead	1962	3.655	3.211	4.160	<0.0001
One parent dead	3844	3.177	2.853	3.538	<0.0001
Other	4378	4.804	4.310	5.354	<0.0001
SES					
High	5073	-	-	-	-
Median	3879	1.111	1.012	1.220	0.0274
Low	5077	1.438	1.317	1.571	<0.0001
Locality					
Rural	11536	-	-	-	-
Trading village	2522	0.972	0.881	1.071	0.5652
Alcohol used in the past 30 days					
No	6246	-	-	-	-
Yes	2152	2.262	1.995	2.564	<0.0001
Religion					
Catholic	6969	-	-	-	-
Protestant	2373	0.851	0.761	0.952	0.0047
Saved/Pentecostal	397	0.393	0.309	0.499	<0.0001
Muslim	1936	1.064	0.942	1.202	0.3169
Others	81	0.395	0.233	0.672	0.0006
Tribe					
Muganda1	9202	-	-	-	-
Munyankole2	1105	1.061	0.906	1.241	0.4618
Munyarwanda3	526	1.430	1.140	1.793	0.0020
Murundi4	189	2.096	1.438	3.055	0.0001
Mukiga5	122	1.555	0.994	2.432	0.0533
Mutanzania6	370	2.177	1.640	2.890	<0.0001

Table 4. Odds of Ever Having Had Sexual among Rakai Adolescents 15-19 years, 1994-2011 (R1-R14) Multivariate Models, Adjusted for All Other Factors in Model

Risk factors	Male (n=5354)				Female (n=6456)			
	Odds Ratio	95% Lower	95% Upper	P-value	Odds Ratio	95% Lower	95% Upper	P-value
Rounds	1.214	1.106	1.331	0.0045	-	-	-	-
Rounds^2	0.986	0.978	0.994	0.0123	-	-	-	-
Age of respondents				<0.0001				<0.0001
15 (ref)	-	-	-	-	-	-	-	-
16	1.487	1.202	1.839	0.0003	2.012	1.531	2.644	<0.0001
17	2.164	1.730	2.708	<0.0001	3.594	2.679	4.822	<0.0001
18	4.661	3.743	5.805	<0.0001	7.215	5.123	9.987	<0.0001
19	8.785	6.815	11.323	<0.0001	16.183	10.532	24.868	<0.0001
Current school				<0.0001				<0.0001
Yes (ref)	-	-	-	-	-	-	-	-
No	1.778	1.534	2.061	<0.0001	6.663	5.368	8.271	<0.0001
Orphanhood status								<0.0001
Both parents in household	-	-	-	-	-	-	-	-
Both parent dead	-	-	-	-	2.978	2.074	4.276	<0.0001
One parent dead	-	-	-	-	2.534	1.870	3.434	<0.0001
Alcohol used in the past 30 days				<0.0001				<0.0001
No (ref)	-	-	-	-	-	-	-	-
Yes	1.926	1.642	2.258	<0.0001	2.017	1.550	2.626	<0.0001
Religion				0.0004				0.0017
Catholic (ref)	-	-	-	-	-	-	-	-
Protestant	0.992	0.827	1.191	0.9354	1.135	0.863	1.491	0.3648
Saved/Pentecostal	0.470	0.259	0.852	0.0128	0.515	0.251	1.054	0.0695
Muslim	1.495	1.194	1.873	0.0005	1.709	1.244	2.346	0.0009
Others	0.889	0.358	2.205	0.8004	2.219	0.731	6.733	0.1593
Tribe				0.0396				0.1618
Muganda1 (ref)	-	-	-	-	-	-	-	-
Munyangole	0.706	0.527	0.944	0.0190	0.969	0.653	1.438	0.8762
Munyarwanda	0.885	0.581	1.348	0.5692	1.075	0.641	1.803	0.7831
Murundi	1.297	0.686	2.452	0.4244	2.035	0.769	5.381	0.1522
Mukiga	1.962	0.980	3.931	0.0572	0.579	0.212	1.582	0.2868
Mutanzania	0.750	0.468	1.203	0.2323	2.334	1.078	5.052	0.0315

Figure 1. Distribution by Age, Adolescent Men (1994-2011)

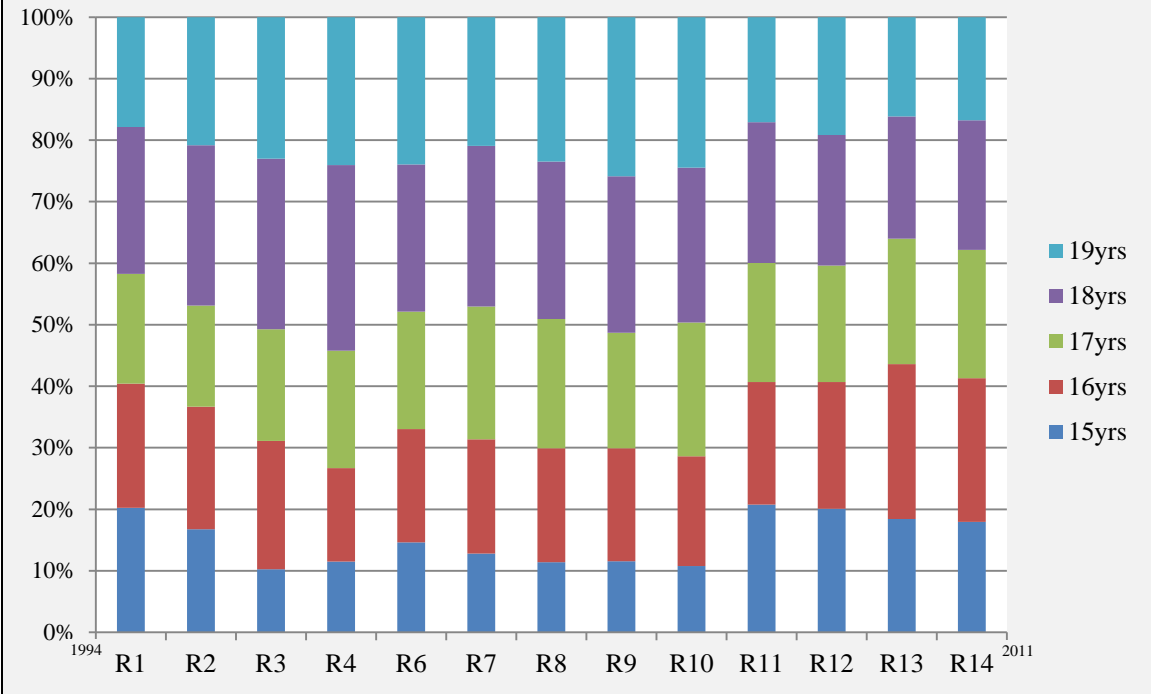


Figure 2. Distribution by Age, Adolescent Women (1994-2011)

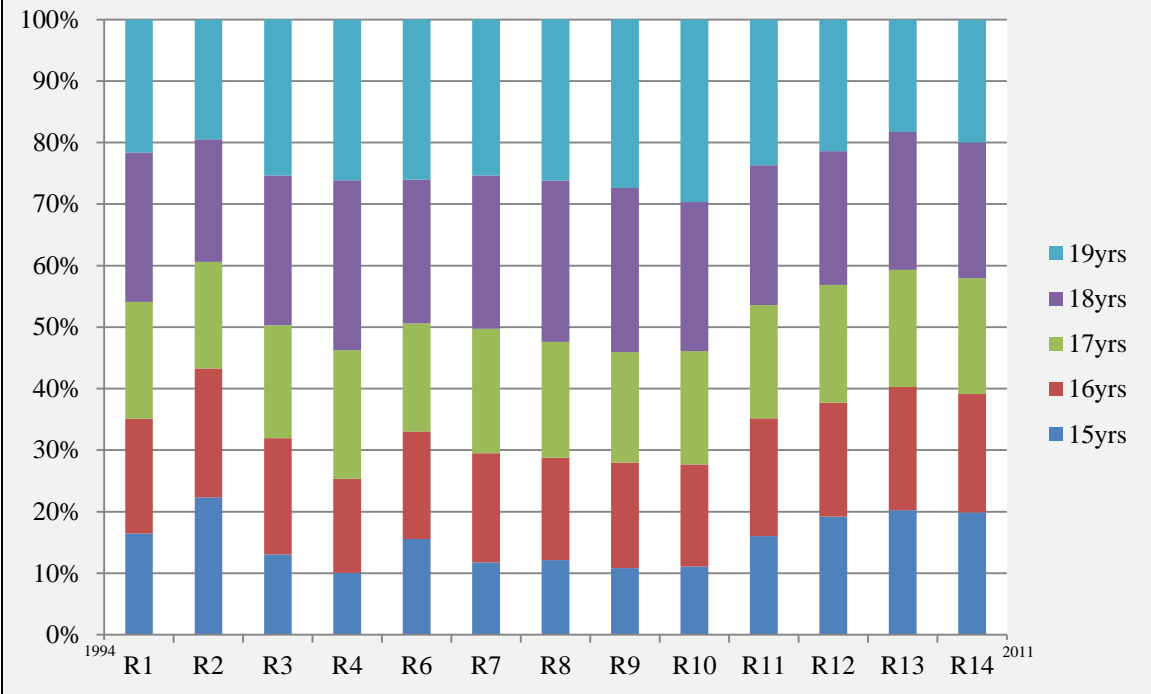


Figure 3. Sexual Experience by Age, Adolescent Men (1994-2011)

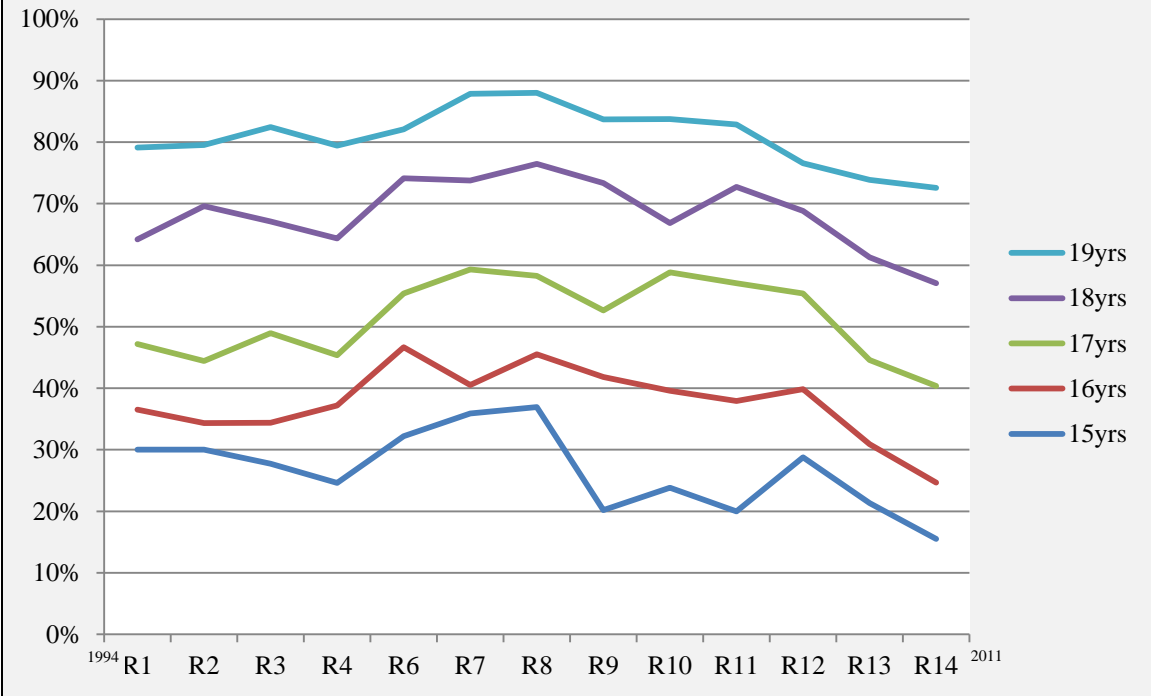


Figure 4. Sexual Experience by Age, Adolescent Women (1994-2011)

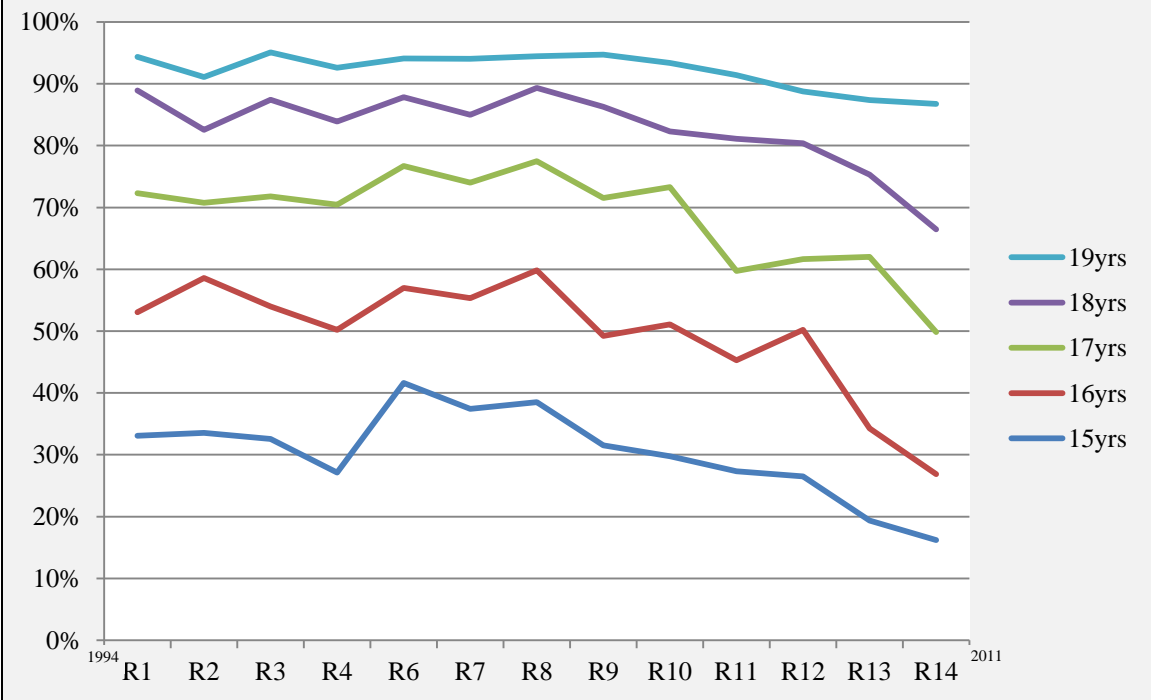


Figure 5. School Enrollment by Age, Adolescent Men (1994-2011)

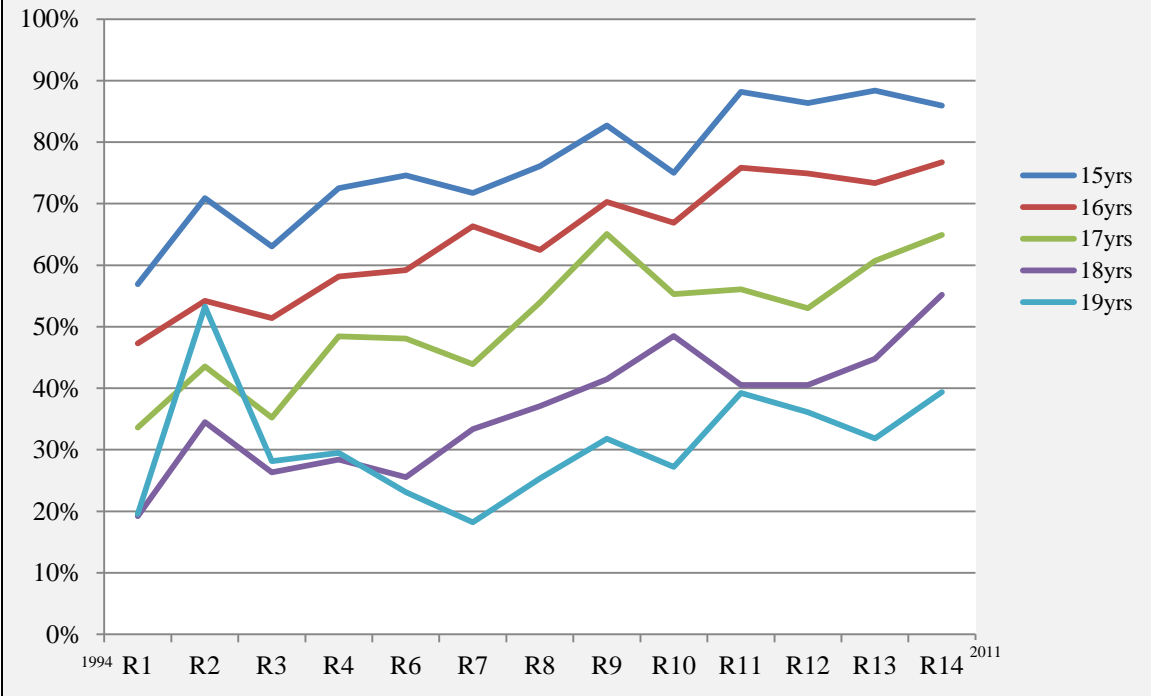


Figure 6. School Enrollment by Age, Adolescent Women (1994-2011)

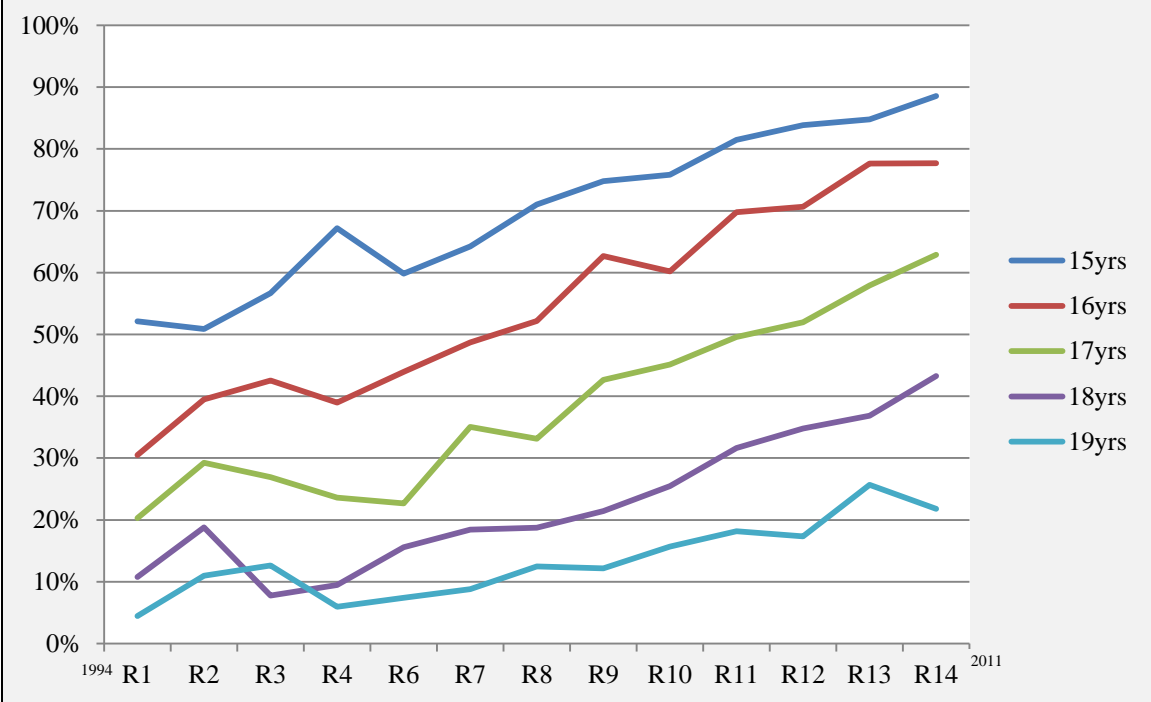


Figure 7. Current Marriage by Age, Adolescent Men (1994-2011)

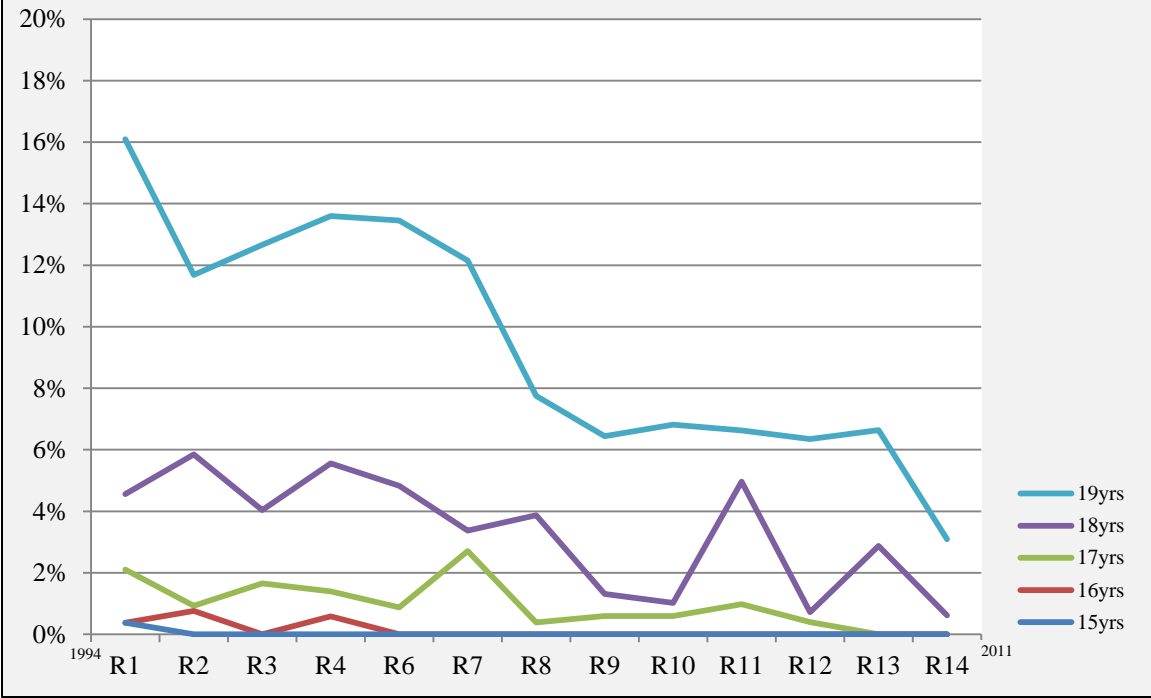


Figure 8. Current Marriage by Age, Adolescent Women (1994-2011)

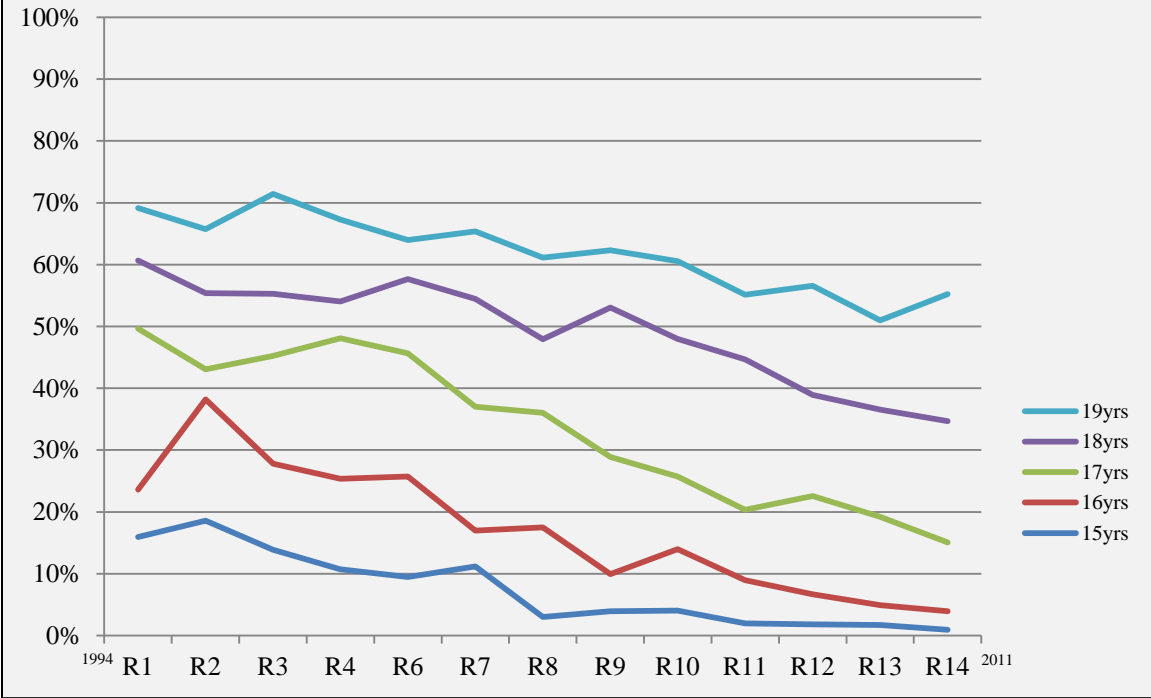


Figure 9. Sexual Experience by Circumcision Status, Adolescent Men (1994-2011)



Figure 10. Sexual Experience by School Participation, Adolescent Men & Women (1994-2011)

