

**Demography Comprehensive Examination
March 2018**

Day 1: General

PLEASE CHOOSE ONE OF THE FOLLOWING TWO FERTILITY QUESTIONS TO ANSWER

1. What is a “fertility transition”? What are its causes and consequences at the individual and/or familial level? And, what are its causes and consequences at the macro level?

2. Recent estimates (Finer and Zolna 2016) suggest that 75% of pregnancies occurring to women ages 15-19 in the United States are unintended; 59% of pregnancies occurring to women ages 20-24 are unintended; and 31% of pregnancies occurring to women ages 30-34 are unintended. These estimates, based on data from 2011, are respectively 7, 5, and 4 percentage points lower than estimates based on data from 2008. In your professional opinion, are each of these estimates (from 2011) likely to be accurate, understated, or overstated and why? And, what are the most plausible explanations for declining shares of pregnancies between 2008 and 2011 that are unintended and age variation in these declines?

PLEASE CHOOSE ONE OF THE FOLLOWING TWO MORTALITY QUESTIONS TO ANSWER

1. Among the main theories in demography, there are two “transition” theories: the demographic transition and the epidemiologic transition. How do these theories explain remarkable and unprecedented gains in life expectancy during the past 250 years and especially since 1900? Furthermore, unlike the past, the full consequences of the demographic and epidemiological transitions are still unclear, especially for the immediate and long-term future of post-transition societies. The three theoretical scenarios that received the most attention among demographers are: (a) expansion of morbidity and disability (Olshansky et al. 1991), (b) compression of morbidity (Fries 1980), and (c) dynamic equilibrium (Manton 1982). Please describe each of these scenarios and discuss their potential implications for increases in the number and proportion of older people (65+) and especially the oldest-old (85+), their quality of life, and the healthcare needs of our society.

(2nd question is on the next page)

2.

Figure 1. Life expectancy at birth by gender and race: United States, 1950-2015

Source: National Center for Health Statistics, Health, United States, 2017

There is a well-documented gender health-survival paradox in population health research: men have better health (lower morbidity and disability) but higher mortality at every age relative to women. This paradox has been overwhelmingly studied by comparing two monolithic categories of men and women (binary between-gender comparisons). Interestingly, the evidence for the gender health paradox changes at the intersection of gender and race, as shown in Figure 1 with respect to life expectancy. On the one hand, white men and black women have very similar life expectancy trends, which attenuates the evidence for men's mortality disadvantage relative to women. On the other hand, the paradox becomes even more striking if we compare the dramatic life expectancy advantage of white women relative to black men. Please discuss the implications of the patterns in Figure 1 for our understanding of the gender health-survival paradox and provide potential explanations for the between- and within-group differences in life expectancy at the intersection of gender and race.

PLEASE CHOOSE ONE OF THE FOLLOWING TWO MIGRATION QUESTIONS TO ANSWER

1. Massey et al. (1993), "Theories of International Migration: A Review and Appraisal," remains a well-cited review of migration theories for understanding what propels international migration. How has more recent theoretical or empirical research supported or detracted from Massey et al. (1993), or pointed to new dimensions of international migration not considered by Massey et al. (1993)?

2. Researchers have increasingly incorporated migration and immigrant factors into health research. Citing three studies describe in detail what you think are major findings in the subfield of migration and health, and explain key population variables in the research designs that can produce significantly different outcomes. From the perspective of contemporary international migration, explain the resourcefulness, or limitations, of the migration/immigrant perspective for health research.

PLEASE CHOOSE ONE OF THE FOLLOWING TWO DEMOGRAPHIC TECHNIQUES AND METHODS QUESTIONS TO ANSWER

- Marriage and fertility questions [*In all cases, elaborate and be explicit about your assumptions*].
- How would a sudden reduction of period TFR in Saudi Arabia—from 5.0 to 1.0—and continued TFR at that level into the future affect:
 - The frequency of polygamous marriage (currently about 500,000 Saudi men are polygamous)
 - The frequency of marriages between 1st cousins? Currently, 30-40% of

marriages in Gulf Arab states are contracted between first cousins.

- Assume that consanguineous marriage is associated with higher infant mortality: is it easier to identify this effect in societies with low or high infant mortality?
- How would your answers to any of these questions be different if, at the same time as the reduction in TFR, the sex ratio at birth in Saudi Arabia rose from 1.05 to 1.25?
- Refer to the abridged 2010-2014 life table for males in Russia. Six numbers have been removed from this life table and are indicated as letters. Please calculate each of the missing values. Show your work and circle your answers (a – f).
 - What percentage of people survived from age 50 to 80?
 - How would you describe the relationship ? And how else you could get the same answer?
 - What is the probability that a set of 4 male cousins who celebrate their 2nd, 4th, 10th and 12th birthdays on June 30, 2014 will all survive to age 70?
 - What is the probability that the same set of 4 cousins will all be alive 68 years later (i.e., when the youngest is 70)?

Male life expectancy, Russia, 2010-2014

Source: https://www.mortality.org/hmd/RUS/STATS/mltper_5x5.txt

Age	mx	qx	ax	lx	dx	Lx	Tx	ex
0	0.00893	0.00886	0.13	100000	886	99231	6436594	64.37
1-4	0.00053	0.00212	1.70	99114	210	395972	(e)	63.94
5-9	0.00031	0.00157	2.46	98904	155	494125	5941391	60.07
10-14	0.00037	0.00185	2.78	(a)	182	493339	5447266	55.16
15-19	0.00110	0.00550	2.91	98566	542	491699	4953928	50.26
20-24	0.00234	(b)	2.70	98025	1141	487494	4462229	45.52
25-29	0.00391	0.01937	2.70	96884	1877	480107	3974735	41.03
30-34	0.00620	0.03057	2.61	95007	2904	468103	3494628	36.78
35-39	(d)	0.03771	2.52	92103	3473	451894	3026526	32.86
40-44	0.00893	0.04369	2.56	88629	3872	433709	2574631	29.05
45-49	0.01198	0.05822	2.59	84757	4934	411899	2140923	25.26
50-54	0.01650	0.07937	2.59	79823	6335	383851	1729023	21.66
55-59	0.02361	0.11166	2.58	73487	8206	347585	1345172	18.30
60-64	0.03416	0.15749	2.53	65282	10281	301009	997587	15.28
65-69	0.04414	0.19909	2.54	55001	10950	248081	696578	12.66
70-74	0.06338	0.27364	2.51	44051	12054	190185	448498	10.18
75-79	0.08893	0.36284	2.46	31997	11610	130546	258312	8.07
80-84	0.12569	0.47294	2.38	20387	9642	76710	127767	(f)
85-89	0.17942	0.60353	2.29	10745	6485	36144	51057	4.75
90-94	0.26748	0.75427	2.11	4260	3213	(c)	14912	3.50
95-99	0.34687	0.83876	1.92	1047	878	2531	2899	2.77
100-104	0.45019	0.90855	1.72	169	153	341	368	2.18
105-109	0.55829	0.94975	1.53	15	15	26	27	1.78
110+	0.64512	1.00000	1.55	1	1	1	1	1.55