Appendix A: The questionnaire for the health examination population

I. Basic Information

Ethnicity: □ Han □ Ethnic minority

Place of Birth: Province _____ City _____ County _____

Marital Status: □ Unmarried □ Married (including cohabitation) □ Widowed □ Divorced □ Other

Education Level: □ Primary school or below □ Junior high school □ Senior high school

□ Technical secondary school or vocational school □ University (Bachelor's/Associate degree)

□ Postgraduate or above

Occupation: □ Civil servant □ Professional/Technical personnel □ Office worker/Clerk

□ Enterprise manager □ Worker □ Farmer □ Student □ Active-duty military personnel

□ Freelancer/Self-employed □ Individual business operator □ Unemployed

□ Retiree □ Other

Health Insurance Category: □ Urban Employee Basic Medical Insurance

□ Urban Resident Basic Medical Insurance □ New Rural Cooperative Medical Scheme

□ Other □ None

II. Lifestyle and Dietary Habits

1. Do you drink alcohol? (On average, more than once per week)

A. No B. Yes C. Former drinker (quit for over 1 year)

2. Do you smoke? (Having smoked continuously for over 1 year)

A. Never B. Daily C. Former smoker (quit for over 1 year)

D. Passive smoking (exposed for over 15 minutes daily, and over 1 day per week)

3. Do you usually eat three meals on time?

A. Yes B. Mostly C. No

4. Do you often overeat?

A. Yes B. No

5. Do you often eat late-night snacks?

A. Never B. Occasionally(≤1 time/week) C. Often(>1 time/week)

6. How often do you attend banquets or business dinners (social engagements)?

A. Never or rarely (≤1 time/week) B. Quite often (2-3 times/week)

C. Often (4-5 times/week) D. Very frequently (>5 times/week)

7. What is your dietary taste preference?

A. Light B. Salty C. No specific preference

8. What are your dietary preferences?

A. Smoked, cured/pickled foods B. High fat or fried foods C. Desserts

D. Spicy food E. Excessively hot food

F. Snacks G. Fast food H. Other

9. What is your staple food structure?

A. Mainly refined grains B. Mix of refined and whole grains

C. Mainly whole grains D. Hard to say

10. Do you drink milk (including yogurt)?

A. Never B. Occasionally (1-2 times/week)

C. Often (3-5 times/week) D. Daily (≥6 times/week)

11. Do you eat eggs?

A. Never B. Occasionally (1-2 times/week)

C. Often (3-5 times/week) D. Daily (≥6 times/week)

12. Do you eat Legumes and legume derivatives?

A. Never B. Occasionally (1-2 times/week)

C. Often (3-5 times/week) D. Daily (≥6 times/week)

13. Do you eat fruit?

A. Never B. Occasionally (1-2 times/week)

C. Often (3-5 times/week) D. Daily (≥6 times/week)

14. On average, how many vegetables do you eat per day?

A. <100g B. 100～200g C. 200～500g D. >500g

15. On average, how much meat (pork, beef, lamb, poultry) do you eat per day?

A. <50g B. 50～100g C. 101～250g D. >250g

16. Do you eat fatty meat?

A. Never B. Occasionally (1-2 times/week)

C. Often (3-5 times/week) D. Daily (≥6 times/week)

17. Do you eat animal organs (offal)?

A. Never B. Occasionally (1-2 times/week)

C. Often (3-5 times/week) D. Daily (≥6 times/week)

18. Do you eat fish or seafood?

A. Never B. Occasionally (1-2 times/week)

C. Often (3-5 times/week) D. Daily (≥6 times/week)

19. Do you drink coffee?

A. Never B. Occasionally (1-2 times/week)

C. Often (3-5 times/week) D. Daily (≥6 times/week)

20. Do you drink sugar-sweetened beverages (juice, cola, etc.)?

A. Never B. Occasionally (1-2 times/week)

C. Often (3-5 times/week) D. Daily (≥6 times/week)

Appendix B: The questionnaire on dietary habits for the health examination population

1. What is the number of permanent residents in your household?

○ 3 or fewer

○ 3-5

○ 6 or more

2. Do you have the habit of sharing your own tableware to pick up food for family members or friends?

○ Yes

○ No

3. Within your household, do family members have their own designated personal tableware (e.g., bowls, chopsticks)?

○ Yes

○ Some members do

○ No

4. Do you have the habit of disinfecting tableware?

○ Yes, regularly

○ Occasionally

○ No

5. How often does your household replace its tableware?

○ Within 3 months

○ Between 3 months and 1 year

○ More than 1 year

6. Are you familiar with the concept of serving chopsticks? (Serving chopsticks are dedicated utensils used only for transferring food from communal dishes to one's own plate/bowl, not for eating.)

○ Yes

○ No

Appendix C: Large-Scale Epidemiological Survey on H. pylori Infection in Chinese Households

(One Form per Household)

Household ID		Head of Household Name		Contact Phone Number		Number of Cohabiting Members	
Family Structure	1 Self (Head) 2 Husband 3 Wife 4 Son/Daughter 5 Father 6 Mother 7 Sibling(s) 8 Daughter-in-law/Son-in-law 9 Grandfather 10 Grandmother 11 Grandchild 12 Grandchild's Spouse 13 Other						
Household Address							

Household-Level Questions

1. Household Economic and Living Conditions		
1.1	Annual Household Income: 1. < ¥100,000 2. ¥100,000-¥300,000 3. > ¥300,000	
1.2	Residential Area Type: 1. Urban 2. Urban-Rural Fringe/Small Town/Suburb 3. Rural	
1.3	Total Living Area (Floor Area in m^2): 1. < 60 2. 60-120 3. > 120	
1.4	Does the household keep any animals? 1. No 2. Yes	
1.4.1	If Yes, what type? 1. Pet(s) 2. Poultry 3. Livestock	
2. Household Hygiene and Living Habits		
2.1	Primary Source of Drinking Water: 1. Bottled water 2. Purified water 3. Tap water 4. Well Water 5. Other	
2.2	How are dishes/chopsticks washed? 1. Tap water 2. In a Basin/Still Water	
2.3	How are dishes/chopsticks disinfected? 1. No Disinfection	

	2. Automatic Sterilizing Cabinet 3. Other Method(s)	
2.4	Do you practice meal portioning (individual servings) during family meals? 1. Yes 2. No	
2.5	Do you use serving chopsticks/spoons during family meals? 1. Yes 2. No	

Individual Member Module (To be completed for each household member)

4. General Information of Family Member							
Household Member ID		Full Name		Contact Phone		ID Card Number	
Gender	1. Male 2. Female	Ethnicity		Date of Birth			
4.1	Duration of cohabitation in this household: 1. < 1 year 2. ≥ 1 year 3. ≥ 5 years 4. ≥ 10 years						
4.2	Marital Status: 1. Unmarried 2. Married 3. Other						
4.3	Education Level: 1. Primary School or below 2. Middle School / High School 3. College / University or above						
4.4	Occupation: 1. Worker 2. Farmer 3. Teacher 4. Management/Technical Personnel 5. Medical Personnel 6. Student 7. Military 8. Retired 9. Self-employed 10. Other						
5. Results of *H. pylori* Testing in This Survey							
5.1	Test Result: 1. Positive 2. Negative						

Supplementary Table 1 Univariate analysis of factors associated with *Helicobacter pylori* infection in health examination populations, *n* (%)

Categories	***H. pylori***	***H. pylori***	***P* value**

	uninfected, *n* = 55328	**infected, *n* = 16335**	
Age [mean (SD)]	43.4 (11.8)	45.1 (11.3)	< 0.001
Gender			0.013
Female	20726 (37.5)	6294 (38.5)	
Male	34602 (62.5)	10041 (61.5)	
Ethnicity			0.308
Han	53669 (97.0)	15851 (97.0)	
Tujia	704 (1.3)	207 (1.3)	
Miao	370 (0.7)	92 (0.6)	
Yao	116 (0.2)	47 (0.3)	
Dong	118 (0.2)	31 (0.2)	
Other ethnic groups	351 (0.6)	107 (0.7)	
Marital			< 0.001
Unmarried	7150 (12.9)	1717 (10.5)	
Married or cohabitated	48178 (87.1)	14618 (89.5)	
Education			< 0.001
Junior high school or below	4521 (12.5)	1749 (15.5)	
Senior high school	5863 (16.3)	2058 (18.2)	
College or above	25681 (71.2)	7507 (66.4)	
Occupation			< 0.001
Unfixed	9692 (26.9)	3304 (29.2)	
Fixed	26366 (73.1)	8018 (70.8)	
Smoking			0.417
Never smoked	36092 (65.2)	10761 (65.9)	
Daily smoker	14749 (26.7)	4296 (26.3)	
Former smoker	1961 (3.5)	551 (3.4)	
Regular secondhand smoke exposure	2520 (4.6)	725 (4.4)	
Drinking			0.036

Never drank	35545 (64.2)	10319 (63.2)	
Current drinker	18929 (34.2)	5767 (35.3)	
Former drinker (no alcohol in past year)	849 (1.5)	248 (1.5)	
Structured three meal patterning			0.020
Consistent	37778 (68.3)	11017 (67.5)	
Inconsistent	3147 (5.7)	1015 (6.2)	
Partially consistent	14387 (26.0)	4299 (26.3)	
Late night snacks			< 0.001
No late-night snacks	34625 (62.6)	10711 (65.6)	
≤ 1 time/week	18820 (34.0)	5150 (31.5)	
> 1 time/week	1876 (3.4)	473 (2.9)	
Overeating			0.268
No	51831 (93.7)	15263 (93.4)	
Yes	3492 (6.3)	1071 (6.6)	
Social dining			0.001
≤ 1 time/week	43545 (78.7)	12650 (77.5)	
2-3 times/week	9668 (17.5)	2970 (18.2)	
4-5 times/week	1665 (3.0)	554 (3.4)	
≥ 6 times/week	445 (0.8)	159 (1.0)	
Dietary taste			0.037
Light	22694 (41.0)	6612 (40.5)	
Salty	16724 (30.2)	5109 (31.3)	
No specific preference	15905 (28.7)	4613 (28.2)	
Smoked or cured foods			
No	52410 (94.7)	15382 (94.2)	0.006
Yes	2918 (5.3)	953 (5.8)	
High fat or fried foods			0.260
No	53354 (96.4)	15721 (96.2)	
Yes	1974 (3.6)	614 (3.8)	

Dessert			0.607
No	50956 (92.1)	15065 (92.2)	
Yes	4372 (7.9)	1270 (7.8)	
Spicy food			< 0.001
No	39704 (71.8)	11348 (69.5)	
Yes	15624 (28.2)	4987 (30.5)	
Excessively hot food			0.063
No	50618 (91.5)	14868 (91.0)	
Yes	4710 (8.5)	1467 (9.0)	
Snacks			0.093
No	48797 (88.2)	14486 (88.7)	
Yes	6531 (11.8)	1849 (11.3)	
Fast food			0.002
No	52322 (94.6)	15551 (95.2)	
Yes	3006 (5.4)	784 (4.8)	
No aforementioned habits			0.003
No	36386 (65.8)	10945 (67.0)	
Yes	18942 (34.2)	5390 (33.0)	
Food structure			0.011
Mainly whole grains	3862 (7.0)	1168 (7.2)	
Mainly refined grains	23153 (41.9)	7004 (42.9)	
Mix of refined and whole grains	21181 (38.3)	6193 (37.9)	
Not sure	7127 (12.9)	1968 (12.0)	
Milk			< 0.001
Never	18521 (33.5)	5781 (35.4)	
1-2 times/week	27439 (49.6)	7981 (48.9)	
3-5 times/week	7194 (13.0)	2008 (12.3)	
≥ 6 times/week	2168 (3.9)	564 (3.5)	
Eggs			0.763

Never	2235 (4.0)	679 (4.2)	
1-2 times/week	24177 (43.7)	7129 (43.6)	
3-5 times/week	21600 (39.0)	6408 (39.2)	
≥ 6 times/week	7310 (13.2)	2117 (13.0)	
Legumes and legume derivatives			0.003
Never	3270 (5.9)	1092 (6.7)	
1-2 times/week	35914 (64.9)	10578 (64.8)	
3-5 times/week	15123 (27.3)	4376 (26.8)	
≥ 6 times/week	1016 (1.8)	288 (1.8)	
Fruit			< 0.001
Never	2050 (3.7)	702 (4.3)	
1-2 times/week	25540 (46.2)	7801 (47.8)	
3-5 times/week	21981 (39.7)	6235 (38.2)	
≥ 6 times/week	5752 (10.4)	1596 (9.8)	
Daily vegetable consumption			0.009
≤ 100 g	11903 (21.5)	3598 (22.0)	
100-200 g	33000 (59.7)	9849 (60.3)	
200-500 g	9207 (16.6)	2556 (15.6)	
≥ 500 g	1212 (2.2)	331 (2.0)	
Daily meat consumption			0.160
≤ 50 g	12534 (22.7)	3586 (22.0)	
50-100 g	32252 (58.3)	9542 (58.4)	
100-250 g	9593 (17.3)	2926 (17.9)	
≥ 250 g	944 (1.7)	280 (1.7)	
Fat meat			0.001
Never	19334 (34.9)	5616 (34.4)	
1-2 times/week	31925 (57.7)	9387 (57.5)	
3-5 times/week	3857 (7.0)	1280 (7.8)	
≥ 6 times/week	207 (0.4)	51 (0.3)	

Animal offal			< 0.001
Never	16794 (30.4)	4644 (28.4)	
1-2 times/week	36560 (66.1)	11039 (67.6)	
3-5 times/week	1921 (3.5)	635 (3.9)	
≥ 6 times/week	48 (0.1)	16 (0.1)	
Fish seafood			0.859
Never	3402 (6.1)	1006 (6.2)	
1-2 times/week	40235 (72.7)	11829 (72.4)	
3-5 times/week	11408 (20.6)	3414 (20.9)	
≥ 6 times/week	276 (0.5)	85 (0.5)	
Coffee			0.210
Never	40370 (73.0)	11869 (72.7)	
1-2 times/week	12570 (22.7)	3797 (23.2)	
3-5 times/week	1698 (3.1)	492 (3.0)	
≥ 6 times/week	685 (1.2)	176 (1.1)	
Sugar sweetened beverages			0.029
Never	28609 (51.7)	8635 (52.9)	
1-2 times/week	23345 (42.2)	6777 (41.5)	
3-5 times/week	3090 (5.6)	850 (5.2)	
≥ 6 times/week	277 (0.5)	72 (0.4)	

Supplementary Table 2 Demographic characteristics and *Helicobacter pylori* infection risk factors in 262 households, *n* (%)

Categories	**Uninfected household, *n* = 95**	**Infected household, *n* = 167**	***P* value**
Family structure			0.234
Couple without children	32 (33.7)	50 (29.9)	
Couple with children	17 (7.9)	40 (24.0)	

Single-parent or one-parent-out-migrant family	21 (22.1)	21 (12.6)	
Sibling-only household	9 (9.5)	21 (12.6)	
Three-generation household	8 (8.4)	23 (13.8)	
Other	8 (8.4)	12 (7.2)	
Children			0.110
None	71 (74.7)	124 (74.3)	
Children under 5 years old	4 (4.2)	18 (10.8)	
Children aged 6-18	20 (21.1)	25 (15.0)	
Annual household income (thousand yuan)			0.837
< 100	49 (51.6)	92 (55.1)	
100-300	37 (38.9)	59 (35.3)	
> 300	9 (9.5)	16 (9.6)	
Household living area (m^2)			0.772
< 60	7 (7.4)	13 (7.8)	
60-120	37 (38.9)	72 (43.1)	
> 120	51 (53.7)	82 (49.1)	
Pets in household			1.000
No	82 (86.3)	145 (86.8)	
Yes	13 (13.7)	22 (13.2)	
Living together time (year)			0.439
< 1	10 (10.5)	9 (5.4)	
1-5	9 (9.5)	20 (12.0)	
6-10	14 (14.7)	28 (16.8)	
> 10	62 (65.3)	110 (65.9)	
Sources of drinking water			0.389
Bottled water	12 (12.6)	34 (20.4)	
Purified water	4 (4.2)	5 (3.0)	
Boiled tap water	76 (80.0)	125 (74.9)	
Well water	3 (3.2)	3 (1.8)	

Dishwashing			0.252
In a basin	19 (20.0)	23 (13.8)	
Tap water	76 (80.0)	144 (86.2)	
Tableware sterilisation			0.414
No	46 (48.4)	91 (54.5)	
Yes	49 (51.6)	76 (45.5)	
Individual dining			0.836
No	82 (86.3)	147 (88.0)	
Yes	13 (13.7)	20 (12.0)	
Serving chopsticks			0.385
No	65 (68.4)	124 (74.3)	
Yes	30 (31.6)	43 (25.7)	

Supplementary Table 3 Demographic characteristics and *Helicobacter pylori* infection risk factors in couples, *n* (%)

Categories	**Uninfected household, *n* = 32**	**Infected household, *n* = 50**	***P* value**
Annual household income (thousand yuan)			0.455
< 100	18 (56.2)	33 (66.0)	
100-300	13 (40.6)	14 (28.0)	
> 300	1 (3.1)	3 (6.0)	
Household living area (m^2)			0.487
< 60	1 (3.1)	4 (8.0)	
60-120	12 (37.5)	22 (44.0)	
> 120	19 (59.4)	24 (48.0)	
Pets in household			1.000
No	27 (84.4)	41 (82.0)	
Yes	5 (15.6)	9 (18.0)	

Living together time (year)			0.367
1-5	2 (6.2)	7 (14.0)	
6-10	3 (9.4)	2 (4.0)	
> 10	27 (84.4)	41 (82.0)	
Sources of drinking water			0.043[a]
Bottled water	3 (9.4)	15 (30.0)	
Purified water	2 (6.2)	0 (0.0)	
Boiled tap water	25 (78.1)	34 (68.0)	
Well water	2 (6.2)	1 (2.0)	
Dishwashing			1.000
In a basin	3 (9.4)	4 (8.0)	
Tap water	29 (90.6)	46 (92.0)	
Tableware sterilisation			0.497
No	18 (56.2)	23 (46.0)	
Yes	14 (43.8)	27 (54.0)	
Individual dining			1.000
No	29 (90.6)	45 (90.0)	
Yes	3 (9.4)	5 (10.0)	
Serving chopsticks			1.000
No	23 (71.9)	37 (74.0)	
Yes	9 (28.1)	13 (26.0)	

[a]$P < 0.05$.

Supplementary Table 4 Demographic characteristics and *Helicobacter pylori* infection risk factors in households with children, *n* (%)

Categories	**Uninfected household, *n* = 24**	**Infected household, *n* = 43**	***P* value**
Family structure			0.094

Couple with children	7 (29.2)	12 (27.9)	
Single-parent or one-parent-out-migrant family	8 (33.3)	4 (9.3)	
Sibling-only household	0 (0.0)	2 (4.7)	
Three-generation household	6 (25.0)	20 (46.5)	
Other	3 (12.5)	5 (11.6)	
Children			0.067
Children under 5 years old	4 (16.7)	18 (41.9)	
Children aged 6-18	20 (83.3)	25 (58.1)	
Annual household income (thousand yuan)			0.657
< 100	8 (33.3)	19 (44.2)	
100-300	12 (50.0)	17 (39.5)	
> 300	4 (16.7)	7 (16.3)	
Household living area (m^2)			0.562
< 60	0 (0.0)	2 (4.7)	
60-120	10 (41.7)	17 (39.5)	
> 120	14 (58.3)	24 (55.8)	
Pets in household			0.995
No	22 (91.7)	38 (88.4)	
Yes	2 (8.3)	5 (11.6)	
Living together time (year)			0.558
< 1	2 (8.3)	2 (4.7)	
1-5	2 (8.3)	1 (2.3)	
6-10	6 (25.0)	15 (34.9)	
> 10	14 (58.3)	25 (58.1)	
Sources of drinking water			0.905
Bottled water	3 (12.5)	6 (14.0)	
Purified water	1 (4.2)	1 (2.3)	
Boiled tap water	20 (83.3)	36 (83.7)	
Dishwashing			0.976

In a basin	7 (29.2)	11 (25.6)	
Tap water	17 (70.8)	32 (74.4)	
Tableware sterilisation			0.597
No	11 (45.8)	24 (55.8)	
Yes	13 (54.2)	19 (44.2)	
Individual dining			1.000
No	21 (87.5)	37 (86.0)	
Yes	3 (12.5)	6 (14.0)	
Serving chopsticks			0.235
No	17 (70.8)	37 (86.0)	
Yes	7 (29.2)	6 (14.0)	