

Supplementary Table S1. General characteristics of participants (n=2085)

	n	%
Gender		
Female	1175	56%
Male	910	44%
Median age (IQR)	54	39-63
Year of birth		
In or before 1950	224	11%
1951-1960	527	25%
1961-1970	467	22%
1971-1980	339	16%
1981-1990	267	13%
After 1990	261	13%
Ethnicity (n=2073)		
Non-Chinese	13	1%
Chinese	2060	99%
Hong Kong permanent residents (n=2072)		
No	41	2%
Yes	2031	98%
Born in Hong Kong (n=2084)		
No	598	29%
Yes	1486	71%
Marital status		
Never married	500	24%
Widowed	104	5%
Separated	7	0.3%
Divorced	148	7%
Married	1240	60%
NA, 15 or below	82	4%
Education level (n=2078)		
Secondary and below	1192	57%
Post-secondary	886	43%
Economically active# (n=1997)		
No	844	42%
Yes	1153	58%

#economically active refers to employer, employee, self-employed, unpaid family worker

Supplementary Table S2. Characteristics comparison among all participants, household representatives, and census population in 2016

	All participants, n=2085 (%)	Household representatives, n=1143 (%)	Population by- census 2016 (%)#
Gender			
Female	56%	55%	52%
Male	44%	45%	48%
Age group (yo)			
0-14	3%	0%	12%
15-34	16%	9%	25%
35-64	60%	67%	47%
>64	21%	24%	17%
Ethnicity			
Non-Chinese	1%	0.4%	4%
Chinese	99%	99.6%	96%
Education level&			
Primary and below	11%	13%	21%
Secondary	45%	45%	46%
Post-secondary	44%	42%	33%

#population excluding foreign domestic helpers; data source: Census and Statistics Department, Hong Kong SAR Government.

&highest level of educational attainment for individuals aged 15 or above

Supplementary Table S3. General characteristics of households (n=1143)

	n	% of building groups in the District	
		%	
District, n=1142			
A	43	4%	4%
B	16	1%	3%
C	118	10%	9%
D	38	3%	4%
E	62	5%	5%
F	99	9%	6%
G	77	7%	6%
H	79	7%	7%
J	102	9%	10%
K	39	4%	4%
L	62	5%	7%
M	60	5%	7%
N	51	4%	3%
P	51	4%	3%
Q	56	5%	5%
R	94	8%	8%
S	75	7%	7%
T	20	2%	2%
Household size (no. of persons), n=1139			
1	163	14%	
2	359	32%	
3	316	28%	
4	229	20%	
5 or above	72	6%	
No. of members joining the study, n=1143			
1	545	48%	
2	374	33%	
3	129	11%	
4	74	6%	
5 or above	21	2%	
Housing type, n=1135			
Public housing	311	27%	
Home ownership scheme	202	18%	
Private housing	618	54%	
Temporary housing	3	0.3%	
Hotel	1	0.1%	
With participating members born in 1986 or after, n=1143			
No	857	75%	
Yes	286	25%	
With member(s) testing HBsAg positive			
No	997	87%	
Yes	146	13%	

Supplementary Table S4. HBsAg prevalence by age groups and gender

Age groups	Male			Female			Population (mid-2019)#	
	n	HBsAg prevalence	95%CI	n	HBsAg prevalence	95%CI	Male (%)	Female (%)
<29	120	0.8	(0-2.4)	114	0.0	(0-0)	13.06	13.04
29-38	108	6.5	(1.8-11.2)	160	8.1	(3.8-12.4)	6.21	9.15
39-48	135	8.1	(3.5-12.8)	186	9.7	(5.4-14)	6.23	9.15
49-58	189	10.1	(5.7-14.4)	276	10.1	(6.6-13.7)	7.29	8.92
59-68	223	7.2	(3.8-10.6)	306	6.9	(4-9.7)	6.95	7.19
>68	130	10.0	(4.8-15.2)	123	6.5	(2.1-10.9)	5.87	6.96

#population estimates from Census and Statistics Department
<https://www.censtatd.gov.hk/en/scode150.html>

Supplementary Table S5. Comparison between HBsAg negative (N=1422) and positive participants (N=105), after exclusion of single member household participants

	HBsAg negative (N=1422)		HBsAg positive (N=105)		Odds Ratio (OR)		adjusted OR [^]	
	n	%	n	%	OR	(95%C.I.)	aOR	(95%C.I.)
Socio-demographics								
Gender, N=1527								
Female	792	93%	59	7%	ref		ref	
Male	630	93%	46	7%	0.98	(0.66-1.46)	0.99	(0.66-1.48)
Median age (IQR), N=1527	51	35-62	55	42.5-62	1.02*	(1.003-1.03)	/	
Year of birth								
<=1990	1198	92%	103	8%	ref			
>1990	224	99%	2	1%	0.10*	(0.03-0.42)	/	
Ethnicity, N=1520								
Non-Chinese	10	100%	0	0%				
Chinese	1405	93%	105	7%	/		/	
Hong Kong permanent residents, N=1519								
No	30	86%	5	14%	ref		ref	
Yes	1385	93%	99	7%	0.43	(0.16-1.13)	0.37	(0.14-1.01)
Born in Hong Kong, N=1527								
No	373	89%	46	11%	ref		ref	
Yes	1049	95%	59	5%	0.46*	(0.3-0.68)	0.50*	(0.33-0.76)
Marital status, N=1453								
Never married	330	96%	13	4%	ref		ref	
Married	1019	92%	91	8%	2.27*	(1.25-4.11)	2.32*	(1.16-4.65)
Education level, N=1520								
Secondary and below	791	91%	76	9%	ref		ref	
Post-secondary	624	96%	29	4%	0.48*	(0.31-0.75)	0.55*	(0.34-0.87)
History of hepatitis or other liver diseases								
Liver diseases, N=1523								
No	1344	93%	94	7%	ref		ref	
Yes	74	87%	11	13%	2.13*	(1.09-4.14)	1.97*	(1.004-3.86)
Fatty liver, N=1527								
No	1353	93%	95	7%	ref		ref	
Yes	69	87%	10	13%	2.06*	(1.03-4.14)	1.92	(0.95-3.87)
Cirrhosis, N=1527								
No	1421	93%	105	7%				

	HBsAg negative (N=1422)		HBsAg positive (N=105)		Odds Ratio (OR) (95%C.I.)		adjusted OR^ (95%C.I.)	
	n	%	n	%	OR		aOR	
Yes	1	100%	0	0%	/			
Liver cancer, N=1527								
No	1420	93%	103	7%	ref		ref	
Yes	2	50%	2	50%	13.79*	(1.92-98.87)	13.05*	(1.78-95.58)
Family member with HBV infection, N=1500								
No	1138	95%	60	5%	ref		ref	
Yes	254	86%	43	14%	3.21*	(2.12-4.86)	3.49*	(2.25-5.42)
Not sure	3	60%	2	40%	12.64*	(2.07-77.1)	10.21*	(1.66-62.77)
Community exposure risk								
History of illicit drug use, N=1459								
No	1354	93%	105	7%				
Yes	0	0%	0	0%	/		/	
Sex experience, N=1463								
No	211	96%	8	4%	ref		ref	
Yes	1147	92%	97	8%	2.23*	(1.07-4.66)	2.08	(0.95-4.57)
No. of lifetime sex partners, N=1430								
None	211	96%	8	4%	ref		ref	
1	824	92%	71	8%	2.27*	(1.08-4.79)	2.09	(0.92-4.74)
2 to 5	256	92%	22	8%	2.27	(0.99-5.2)	2.26	(0.97-5.26)
6 to 10	27	93%	2	7%	1.95	(0.39-9.68)	2.01	(0.4-10.12)
11 or more	9	100%	0	0%	/			
Risk exposure in the healthcare setting								
Frequency of receiving intravenous injection, N=1506								
Never	911	95%	53	5%	ref		ref	
Ever	491	91%	51	9%	1.79*	(1.2-2.66)	1.70*	(1.14-2.54)
Frequency of blood transfusion, N=1499								
Never	1211	93%	88	7%	ref		ref	
Ever	183	92%	17	9%	1.28	(0.74-2.2)	1.16	(0.67-2)
History of dialysis, N=1499								
Never	1390	93%	105	7%				
Ever	4	100%	0	0%	/		/	
History of surgery, N=1502								
Never	791	93%	58	7%	ref		ref	
Ever	607	93%	46	7%	1.03	(0.69-1.54)	0.90	(0.6-1.37)

	HBsAg negative (N=1422)		HBsAg positive (N=105)		Odds Ratio (OR)		adjusted OR [^]	
	n	%	n	%	OR	(95%C.I.)	aOR	(95%C.I.)
Vaccination history								
Self-reported HBV vaccination, N=1517								
No	847	90%	96	10%	ref		ref	
Yes	565	98%	9	2%	0.14*	(0.07-0.28)	0.14*	(0.07-0.29)
HBV childhood immunisation in Hong Kong#, N=1527								
Unlikely	1108	92%	102	8%	ref		ref	
Likely	314	99%	3	1%	0.10*	(0.03-0.33)	0.07*	(0.02-0.24)

Born in Hong Kong in or after 1984, or migrate to Hong Kong at the age 12 or below

[^]age and household member testing HBsAg positive as confounders in multivariable logistic regression

*p<0.05

Supplementary Table S6. Characteristics of participants protected from hepatitis B infection (HBsAg-/Anti-HBs+) (n=1037) and those with current infection (HBsAg+/Anti-HBs-) (n=147)

	currently protected		current infection	
	n	%	n	%
Socio-demographics				
Gender				
Female	587	57%	83	56%
Male	450	43%	64	44%
Median age (IQR)	54	45-63	55	42-63
Year of birth group				
In or before 1950	108	10%	16	11%
1951-1960	281	27%	34	23%
1961-1970	241	23%	46	31%
1971-1980	181	17%	30	20%
1981-1990	140	14%	19	13%
After 1990	86	8%	2	1%
Ethnicity, n=1178				
Non-Chinese	3	0.3%	0	0%
Chinese	1029	99.7%	146	100%
Hong Kong permanent residents, n=1177				
No	26	3%	6	4%
Yes	1006	97%	139	96%
Born in Hong Kong				
No	325	31%	70	48%
Yes	712	69%	77	52%
Marital status, n=1182				
Never married	211	20%	24	16%
Widowed	54	5%	7	5%
Separated	4	0%	0	0%
Divorced	71	7%	18	12%
Married	664	64%	97	66%
NA, aged 15 or below	32	3%	0	0%
HBV vaccination status				
Self-report HBV vaccination				
No	556	54%	136	93%
Yes	475	46%	11	7%
Childhood immunization in Hong Kong#				
Unlikely	886	85%	141	96%
Likely	151	15%	6	4%

Born in Hong Kong in or after 1984, or migrate to Hong Kong at the age 12 or below

Supplementary Table S7. Characteristics of participants who tested anti-HBs+ and HBsAg- (immune), HBsAg+ and anti-HBs- (chronically infected), and HBsAg- and anti-HBs- (susceptible), after the exclusion of cases with unclear status (HBsAg-, anti-HBc+, and anti-HBs-)

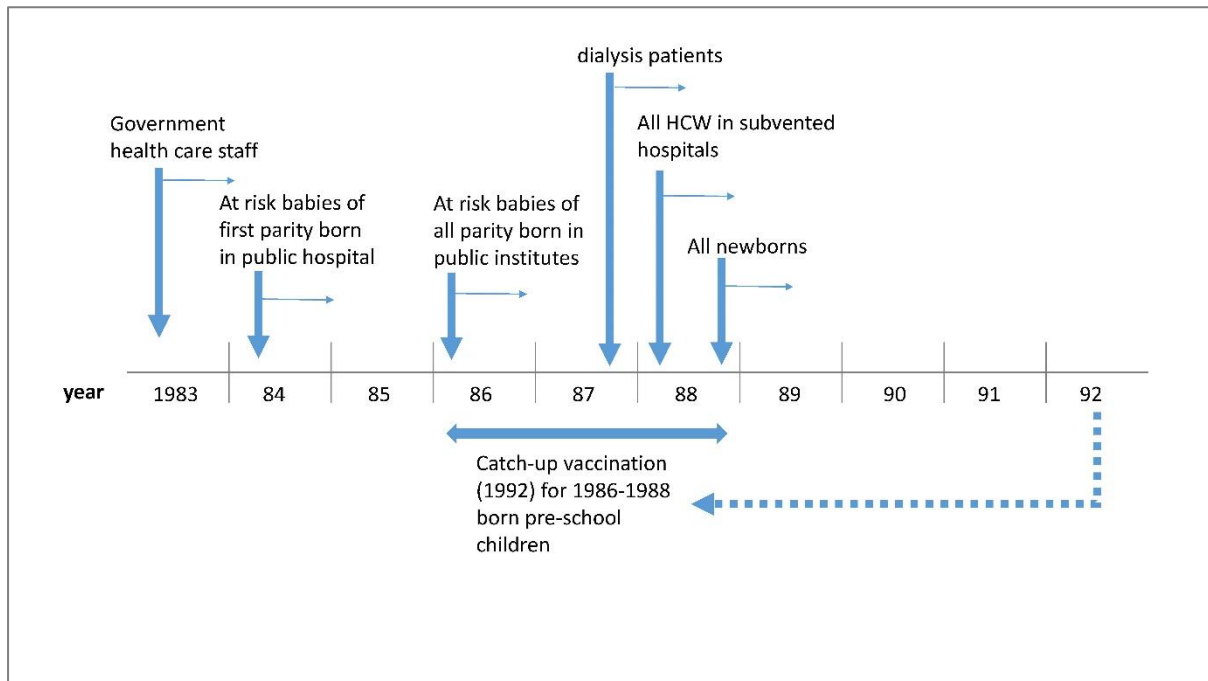
	Immune (n=1037)		Chronically infected (n=155)		Susceptible (n=872)		Multivariable multinomial logistic regression (immune as reference) †			
	n	%	n	%	n	%	aOR	95%CI	aOR	95%CI
Socio-demographics										
Gender, N=2064										
Female	587	57%	88	57%	485	56%	0.98	(0.7-1.39)	0.99	(0.82-1.19)
Male	450	43%	67	43%	387	44%	ref		ref	
Median age (IQR), N=2064	54	(42-63)	56	(45-63)	53	(35-63)	OR=		OR=	
Year of birth group										
In or before 1960	389	38%	54	35%	305	35%	5.97*	(1.43-24.96)	0.42*	(0.31-0.57)
1961-1970	241	23%	49	32%	177	20%	8.74*	(2.08-36.72)	0.40*	(0.29-0.55)
1971-1980	181	17%	31	20%	125	14%	7.36*	(1.72-31.48)	0.37*	(0.26-0.53)
1981-1990	140	14%	19	12%	106	12%	5.84*	(1.33-25.68)	0.41*	(0.28-0.59)
After 1990	86	8%	2	1%	159	18%	ref		ref	
Ethnicity, N=2052										
Non-Chinese	3	0%	0	0%	9	1%	/		3.58	(0.96-13.39)
Chinese	1029	100%	154	100%	857	99%			ref	
Hong Kong permanent residents, N=2052										
No	26	3%	6	4%	9	1%	1.69	(0.68-4.21)	0.37*	(0.17-0.8)
Yes	1006	97%	147	96%	858	99%	ref		ref	
Born in Hong Kong, N=2063										
No	325	31%	76	49%	194	22%	2.03*	(1.44-2.86)	0.66*	(0.54-0.82)
Yes	712	69%	79	51%	677	78%	ref		ref	
Ever married, N=1987										
No	211	21%	24	16%	260	31%	0.88	(0.55-1.41)	1.28*	(1.004-1.64)
Yes	793	79%	130	84%	569	69%	ref		ref	
Education level, N=2057										
Secondary and below	582	56%	109	70%	486	56%	1.76*	(1.22-2.54)	1.04	(0.87-1.25)
Post-secondary	451	44%	46	30%	383	44%	ref		ref	
History of liver diseases, N=2059										
No	978	94%	134	87%	815	94%	0.43*	(0.25-0.73)	0.80	(0.54-1.17)
Yes	58	6%	20	13%	54	6%	ref		ref	
any member tested HBsAg positive										
No	693	89%	89	85%	582	91%	0.63	(0.35-1.13)	1.36	(0.94-1.95)
Yes	84	11%	16	15%	58	9%	ref		ref	
HBV vaccination status										
Self-report HBV vaccination, N=2052										
No	556	54%	143	92%	625	72%	9.53*	(5.22-17.42)	2.59*	(2.11-3.17)
Yes	475	46%	12	8%	241	28%	ref		ref	
HBV childhood immunization in Hong Kong#, N=2064										
Unlikely	886	85%	149	96%	674	77%	2.74*	(1.01-7.42)	1.18	(0.8-1.73)
Likely	151	15%	6	4%	198	23%	ref		ref	

Born in Hong Kong in or after 1984, or migrate to Hong Kong at the age 12 or below

†adjusted by variable of year of birth after 1990 (vs in or before 1990) in multivariable multinomial logistic regression

*p<0.05

Supplementary Fig. 1 Timeline of the evolution of the universal hepatitis B vaccination programme in Hong Kong



Supplementary Fig. 2. Map showing (A). the distribution of participants' residential locations by HBsAg test result (positive and negative); (B) proportion of household index participants testing HBsAg positive; and (C) anti-HBs positive in 18 districts

