

## Preplanned Studies

## Burden of Acute Viral Hepatitis — China, 1990–2019

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## Summary

**What is already known about this topic?**

The World Health Organization's (WHO) Global Health Estimates (GHE) reported that acute hepatitis caused 9,213 deaths and 307,720 person years of disability-adjusted life years (DALYs) in 2016, and acute hepatitis B accounted for 85.81% of all DALYs among acute hepatitis types A, B, C, and E in China.

**What is added by this report?**

In China, the percent changes in years lived with disability (YLDs) due to acute hepatitis A, B, and E in groups aged 50–69 years and 70 years or more and in all age groups for acute hepatitis C were increased from 2000 to 2019.

**What are the implications for public health practices?**

Effective vaccines, interventions, and treatments are key approaches to achieve the WHO's goal of reducing new hepatitis infections by 90% and deaths by 65% between 2016 and 2030.

About 1.4 million people died from viral hepatitis worldwide in 2016, and most deaths were due to cirrhosis and hepatocellular carcinoma caused by hepatitis B and C (1–2). In China, acute hepatitis caused 9,213 deaths, the number of disability-adjusted life years (DALYs) was 307,720 person years, in which acute hepatitis B accounted for 85.81% of DALYs among acute hepatitis types A, B, C, and E in 2016 (3). However, the nationwide incidence and prevalence of acute hepatitis were not yet reported, and the latest results were not reported. In this report, results were obtained from the latest estimates of the Global Burden of Disease Study 2019 (GBD 2019); the incidence, prevalence, deaths, and indicators of burden of acute hepatitis in 1990, 2000, and 2019 were used; and the standardized rates were calculated using the 2010 National Census as the standard population. In 2019, acute hepatitis caused 3,726 deaths, 4,501,755 cases of acute hepatitis, and 214,165 person years of DALYs; hepatitis B accounted for 66.69% of DALYs

among hepatitis A, B, C, and E; percent changes of YLDs in groups aged 50–69 years and 70 years or more for acute hepatitis A, B, and E and in all age groups for acute hepatitis C were increased from 2000 to 2019. Effective vaccines and prompt action on interventions and treatments were major efforts to tackle viral hepatitis to achieve the World Health Organization's (WHO) goal of reducing new hepatitis infections by 90% and deaths by 65% between 2016 and 2030 (4).

Morbidity and mortality due to acute hepatitis resulting from the acute sequelae of hepatitis A virus (HAV), hepatitis B virus (HBV), hepatitis C virus (HCV), and hepatitis E virus (HEV) infections were estimated by the GBD 2019. With respect to morbidity, anti-HAV IgG, hepatitis B surface antigen (HBsAg), anti-HCV IgG, and anti-HEV IgG seroprevalence data were collected through published literature, grey literature, and surveys, and the meta-regression tool (DisMod-MR) utilizing age group, gender, and year was used to estimate seroprevalence and instantaneous seroconversion rates due to acute infections (5). The instantaneous seroconversion rate was converted to the population incidence rate (the number of infections per person in the total population) using the formula: population incidence rate = (instantaneous seroconversion rate) × (1 – seroprevalence) (6). HBsAg seropositivity typically existed only in chronic carriers, and the association of incidence of HBV infections that resulted in chronic carrying was modelled to estimate the incidence from HBsAg seroprevalence data (6).

The prevalences of acute HAV, HBV, HCV, and HEV infections were calculated as the products of the population incidence rate and estimated durations of acute infections of HAV, HBV, HCV, and HEV, which was four weeks for HAV and HEV, and six weeks for HBV and HCV (6). Hereby, incidence meant the number of new acute infection cases of a given hepatitis virus during a year period in a specified population; prevalence implied the proportion of the number of cases of acute viral infections found in a

population.

To calculate mortality, the vital registration, verbal autopsy, cancer registry, and mortality surveillance data were compiled, and the cause-of-death ensemble model (CODEm) was applied to estimate cause-specific mortality by age group, gender, and year for acute HAV, HBV, HCV, and HEV infections (7). Virus specific mortality data for acute hepatitis were too limited to direct use in the CODEm, so a two-step nested-model approach for acute hepatitis virus infections was used to estimate cause-specific mortality. First, the joint mortality from all acute hepatitis using cause-specific mortality data in the CODEm was modelled; second, a separate natural history model for each hepatitis virus infection was developed, in which mortality was estimated as the product of incidence and case fatality (6).

YLDs were estimated as the product of an estimate of prevalence and a disability weight for health states of each mutually exclusive sequela; years of life lost (YLLs) were expressed as the product of mortality estimates and years of life lost due to premature death; and DALYs were calculated as the sum of YLLs and YLDs.

Incidence, prevalence, deaths, and indicators of

burden of acute hepatitis in 1990, 2000, and 2019 by gender were obtained, and their standardized rates were calculated using the 2010 National Census as the standard population, expressed as number and rate (1/100,000), respectively. Percent change (%) was calculated as the difference in quantities between 2019 and 2000 divided by the quantity in 2000. All statistical analyses were performed using SAS (version 9.4, SAS Institute Inc., Cary, USA).

In Table 1, standardized rates of DALYs, YLLs, and YLDs due to acute hepatitis declined when quantities in 2019 were compared to those in 2000, and YLLs had the largest percent decrease for males, females, and both genders combined, with the percent decrease for females being greater than that found in males.

From Tables 2–5, percent changes in the number of person years and standardized rate of DALYs and YLLs in all age groups due to acute hepatitis were decreased when quantities in 2019 were compared to those in 2000. Further comparisons for 2019 and 2000 showed that for acute hepatitis A (Table 2), percent changes in the number of person years and rate of YLDs were increased in groups aged 50–69 years and 70 years or more; for hepatitis B (Table 3), percent changes in the number of person years of YLDs were increased in

TABLE 1. Overall incidence, prevalence, deaths, and burden indicators of acute hepatitis for the years 1990, 2000, and 2019 in China.

Gender	Year	Incidence		Prevalence		Deaths		DALYs		YLLs		YLDs	
		N	P'	N	P'	N	P'	N	P'	N	P'	N	P'
Male													
	1990	38,603,733	5,455.48	3,788,134	555.26	16,651	3.51	887,637	149.59	825,936	139.38	61,700	10.21
	2000	37,113,965	5,159.80	3,701,779	523.55	9,191	1.68	456,024	73.17	388,333	63.23	67,691	9.93
	2019	27,402,638	3,880.05	2,690,260	379.58	2,661	0.33	143,697	19.11	86,490	11.00	57,207	8.11
	2019 vs. 2000 (%)*	-26.17	-24.80	-27.33	-27.50	-71.05	-80.61	-68.49	-73.89	-77.73	-82.61	-15.49	-18.38
Female													
	1990	28,602,658	4,141.05	2,690,025	403.99	9,511	1.91	521,406	82.99	476,669	75.48	44,737	7.51
	2000	26,765,510	3,938.87	2,567,887	383.22	3,952	0.71	216,223	34.91	167,289	27.47	48,934	7.44
	2019	19,342,044	2,974.27	1,811,496	275.44	1,065	0.12	70,468	9.91	30,543	3.82	39,925	6.09
	2019 vs. 2000 (%)*	-27.74	-24.49	-29.46	-28.12	-73.04	-83.25	-67.41	-71.62	-81.74	-86.09	-18.41	-18.19
Both													
	1990	67,206,390	4,818.71	6,478,159	481.98	26,162	2.72	1,409,042	117.47	1,302,605	108.56	106,437	8.91
	2000	63,879,475	4,565.51	6,269,666	455.24	13,143	1.19	672,247	54.53	555,622	45.81	116,625	8.72
	2019	46,744,682	3,433.54	4,501,755	328.24	3,726	0.22	214,165	14.53	117,032	7.42	97,133	7.11
	2019 vs. 2000 (%)*	-26.82	-24.79	-28.20	-27.90	-71.65	-81.57	-68.14	-73.35	-78.94	-83.80	-16.71	-18.48

Note: N: Number of cases for incidence, prevalence, and deaths; number of person years for disability-adjusted life years (DALYs), years of life lost (YLLs), and years lived with disability (YLDs).

P': Standardized rate calculated using the 2010 National Census as the standard population, expressed as 1/100,000.

\* Percent change (%) was calculated as difference value between 2019 and 2000 divided by quantity in 2000.

TABLE 2. Incidence, prevalence, deaths, and burden indicators of acute hepatitis A for the years 1990, 2000, and 2019 in China.

Age group (years)	Year	Incidence			Prevalence			Deaths			DALYs			YLLs			YLDs		
		Number of cases	Rate (1/100,000)	Rate (1/100,000)	Number of cases	Rate (1/100,000)	Rate (1/100,000)	Number of cases	Rate (1/100,000)	Rate (1/100,000)	Number of person-years	Rate (1/100,000)	Rate (1/100,000)	Number of person-years	Rate (1/100,000)	Rate (1/100,000)	Number of person-years	Rate (1/100,000)	Rate (1/100,000)
<5	1990	12,346,148	10,699.23		949,704	823.02		3,527	3.06		312,293	270.63		310,158	268.78		2,134	1.85	
	2000	7,342,017	8,719.38		564,771	670.72		597	0.71		53,774	63.86		52,465	62.31		1,309	1.55	
	2019	5,889,462	7,227.14		453,036	555.93		22	0.03		2,982	3.66		1,905	2.34		1,077	1.32	
	2019 vs. 2000 (%)	-19.78	-17.11		-19.78	-17.11		-96.37	-96.25		-94.45	-94.27		-96.37	-96.25		-17.74	-15.01	
5-14	1990	7,854,676	3,785.08		604,206	291.16		321	0.15		40,464	19.50		25,682	12.38		14,782	7.12	
	2000	7,595,916	3,390.47		584,301	260.81		128	0.06		25,353	11.32		10,211	4.56		15,142	6.76	
	2019	4,527,645	3,159.84		348,280	243.06		5	0.00		9,037	6.31		369	0.26		8,668	6.05	
	2019 vs. 2000 (%)	-40.39	-6.80		-40.39	-6.80		-96.39	-94.36		-64.36	-44.27		-96.38	-94.35		-42.76	-10.50	
15-49	1990	7,576,037	1,133.35		582,772	87.18		3,818	0.57		226,470	33.88		202,265	30.26		24,205	3.62	
	2000	8,538,864	1,144.40		656,836	88.03		1,533	0.21		107,072	14.35		79,636	10.67		27,435	3.68	
	2019	8,105,503	1,124.63		623,500	86.51		133	0.02		32,880	4.56		6,753	0.94		26,126	3.63	
	2019 vs. 2000 (%)	-5.08	-1.73		-5.08	-1.73		-91.30	-90.99		-69.29	-68.21		-91.52	-91.22		-4.77	-1.41	
50-69	1990	111,845	72.60		8,603	5.58		3,398	2.21		103,559	67.22		103,187	66.98		372	0.24	
	2000	245,064	128.21		18,851	9.86		1,245	0.65		38,519	20.15		37,720	19.73		799	0.42	
	2019	839,826	227.67		64,602	17.51		223	0.06		9,319	2.53		6,620	1.79		2,699	0.73	
	2019 vs. 2000 (%)	242.70	77.57		242.70	77.57		-82.07	-90.71		-75.81	-87.46		-82.45	-90.91		237.82	75.05	
70+	1990	456	1.19		35	0.09		1,724	4.51		26,969	70.49		26,968	70.49		2	0.00	
	2000	1,340	2.44		103	0.19		795	1.45		12,027	21.89		12,023	21.89		4	0.01	
	2019	6,817	6.31		524	0.49		218	0.20		3,127	2.90		3,104	2.88		23	0.02	
	2019 vs. 2000 (%)	408.87	158.91		408.87	158.91		-72.61	-86.07		-74.00	-86.77		-74.18	-86.86		407.09	158.00	

Abbreviations: DALYs=disability-adjusted life years; YLLs=years of life lost; YLDs=years lived with disability.

\* Percent change (%) was calculated as difference value between 2019 and 2000 divided by quantity in 2000.

TABLE 3. Incidence, prevalence, deaths, and burden indicators of acute hepatitis B for the years 1990, 2000, and 2019 in China.

Age group (years)	Year	Incidence			Prevalence			Deaths			DALYs			YLLs			YLDs		
		Number of cases	Rate (1/100,000)	Rate (1/100,000)	Number of cases	Rate (1/100,000)	Rate (1/100,000)	Number of cases	Rate (1/100,000)	Rate (1/100,000)	Number of person-years	Rate (1/100,000)	Rate (1/100,000)	Number of person-years	Rate (1/100,000)	Rate (1/100,000)	Number of person-years	Rate (1/100,000)	Rate (1/100,000)
<5	1990	2,184,080	1,892.73		252,009	218.39		2,369	2.05		210,724	182.61		208,934	181.06		1,790	1.55	
	2000	1,610,842	1,913.03		185,866	220.73		766	0.91		68,824	81.74		67,503	80.17		1,321	1.57	
	2019	89,513	109.84		10,328	12.67		95	0.12		8,411	10.32		8,337	10.23		74	0.09	
	2019 vs. 2000 (%)	-94.44	-94.26		-94.44	-94.26		-87.65	-87.24		-87.78	-87.37		-87.65	-87.24		-94.40	-94.22	
5-14	1990	4,055,400	1,954.25		467,931	225.49		146	0.07		14,950	7.20		11,596	5.59		3,354	1.62	
	2000	4,296,507	1,917.76		495,751	221.28		101	0.04		11,499	5.13		7,952	3.55		3,547	1.58	
	2019	185,281	129.31		21,379	14.92		10	0.01		960	0.67		806	0.56		154	0.11	
	2019 vs. 2000 (%)	-95.69	-93.26		-95.69	-93.26		-89.90	-84.21		-91.65	-86.95		-89.87	-84.16		-95.65	-93.21	
15-49	1990	22,618,450	3,383.66		2,609,821	390.42		3,671	0.55		229,312	34.30		190,162	28.45		39,150	5.86	
	2000	23,854,779	3,197.08		2,752,475	368.89		2,775	0.37		186,460	24.99		141,158	18.92		45,301	6.07	
	2019	15,666,424	2,173.70		1,807,664	250.81		658	0.09		64,995	9.02		32,367	4.49		32,628	4.53	
	2019 vs. 2000 (%)	-34.33	-32.01		-34.33	-32.01		-76.29	-75.45		-65.14	-63.91		-77.07	-76.26		-27.98	-25.44	
50-69	1990	3,654,647	2,372.34		421,690	273.73		3,535	2.29		116,089	75.36		106,488	69.12		9,601	6.23	
	2000	4,229,083	2,212.55		487,971	255.29		2,537	1.33		87,336	45.69		76,167	39.85		11,169	5.84	
	2019	5,914,098	1,603.25		682,396	184.99		1,217	0.33		51,939	14.08		36,258	9.83		15,681	4.25	
	2019 vs. 2000 (%)	39.84	-27.54		39.84	-27.54		-52.04	-75.15		-40.53	-69.18		-52.40	-75.33		40.40	-27.25	
70+	1990	642,722	1,679.96		74,160	193.84		1,753	4.58		29,339	76.69		27,729	72.48		1,610	4.21	
	2000	860,264	1,566.06		99,261	180.70		1,481	2.70		25,095	45.68		22,938	41.76		2,157	3.93	
	2019	1,239,558	1,148.11		143,026	132.47		908	0.84		16,521	15.30		13,358	12.37		3,163	2.93	
	2019 vs. 2000 (%)	44.09	-26.69		44.09	-26.69		-38.65	-68.79		-34.17	-66.50		-41.76	-70.37		46.61	-25.40	

Abbreviations: DALYs=disability-adjusted life years; YLLs=years of life lost; YLDs=years lived with disability.

\* Percent change (%) was calculated as difference value between 2019 and 2000 divided by quantity in 2000.

TABLE 4. Incidence, prevalence, deaths, and burden indicators of acute hepatitis C for the years 1990, 2000, and 2019 in China.

Age group (years)	Year	Incidence			Prevalence			Deaths			DALYs			YLLs			YLDs		
		Number of cases	Rate (1/100,000)	Rate (1/100,000)	Number of cases	Rate (1/100,000)	Rate (1/100,000)	Number of cases	Rate (1/100,000)	Rate (1/100,000)	Number of person-years	Rate (1/100,000)	Rate (1/100,000)	Number of person-years	Rate (1/100,000)	Rate (1/100,000)	Number of person-years	Rate (1/100,000)	Rate (1/100,000)
<5	1990	511,319	443.11		58,998	51.13		198	0.17		18,198	15.77		17,375	15.06		823	0.71	
	2000	174,481	207.21		20,132	23.91		55	0.07		5,148	6.11		4,865	5.78		283	0.34	
	2019	200,678	246.26		23,155	28.41		2	0.00		505	0.62		180	0.22		325	0.40	
	2019 vs. 2000 (%)	15.01	18.84		15.01	18.84		-96.31	-96.18		-90.19	-89.86		-96.31	-96.18		14.90	18.73	
5-14	1990	204,102	98.35		23,550	11.35		21	0.01		1,981	0.95		1,650	0.79		331	0.16	
	2000	82,535	36.84		9,523	4.25		13	0.01		1,152	0.51		1,018	0.45		134	0.06	
	2019	79,956	55.80		9,226	6.44		0	0.00		165	0.12		35	0.02		130	0.09	
	2019 vs. 2000 (%)	-3.12	51.47		-3.12	51.47		-96.54	-94.58		-85.68	-77.61		-96.53	-94.58		-3.21	51.34	
15-49	1990	137,739	20.61		15,893	2.38		327	0.05		17,282	2.59		17,059	2.55		223	0.03	
	2000	88,878	11.91		10,255	1.37		209	0.03		10,844	1.45		10,700	1.43		144	0.02	
	2019	92,990	12.90		10,730	1.49		22	0.00		1,211	0.17		1,061	0.15		150	0.02	
	2019 vs. 2000 (%)	4.63	8.32		4.63	8.32		-89.71	-89.35		-88.83	-88.44		-90.09	-89.74		4.59	8.28	
50-69	1990	25,966	16.86		2,996	1.94		332	0.22		10,023	6.51		9,981	6.48		42	0.03	
	2000	41,332	21.62		4,769	2.50		189	0.10		5,717	2.99		5,650	2.96		67	0.04	
	2019	62,256	16.88		7,183	1.95		37	0.01		1,217	0.33		1,116	0.30		101	0.03	
	2019 vs. 2000 (%)	50.62	-21.95		50.62	-21.95		-80.20	-89.74		-78.72	-88.97		-80.26	-89.77		50.58	-21.98	
70+	1990	12,493	32.65		1,441	3.77		169	0.44		2,697	7.05		2,677	7.00		20	0.05	
	2000	32,793	59.70		3,784	6.89		116	0.21		1,849	3.37		1,796	3.27		53	0.10	
	2019	42,243	39.13		4,874	4.51		29	0.03		483	0.45		414	0.38		69	0.06	
	2019 vs. 2000 (%)	28.82	-34.46		28.82	-34.46		-75.46	-87.51		-73.91	-86.72		-76.96	-88.28		28.91	-34.41	

Abbreviations: DALYs=disability-adjusted life years; YLLs=years of life lost; YLDs=years lived with disability.

\* Percent change (%) was calculated as difference value between 2019 and 2000 divided by quantity in 2000.

TABLE 5. Incidence, prevalence, deaths, and burden indicators of acute hepatitis E for the years 1990, 2000, and 2019 in China.

Age group (years)	Year	Incidence			Prevalence			Deaths		DALYs			YLLs			YLDs	
		Number of cases	Rate (1/100,000)	Rate (1/100,000)	Number of cases	Rate (1/100,000)	Rate (1/100,000)	Number of cases	Rate (1/100,000)	Number of person-years	Rate (1/100,000)	Rate (1/100,000)	Number of person-years	Rate (1/100,000)	Rate (1/100,000)	Number of person-years	Rate (1/100,000)
<5	1990	1,049,414	909.43		79,664	69.04	0.18	213	0.18	18,910	16.39	16.28	18,782	16.28	16.28	128	0.11
	2000	790,917	939.29		60,104	71.38	0.09	72	0.09	6,411	7.61	7.50	6,314	7.50	7.50	97	0.12
	2019	744,117	913.13		56,597	69.45	0.01	5	0.01	493	0.61	0.49	402	0.49	0.49	92	0.11
	2019 vs. 2000 (%)	-5.92	-2.79		-5.84	-2.70	-93.42	-93.64	-93.42	-92.30	-92.05	-93.43	-93.64	-93.43	-93.43	-5.89	-2.76
5-14	1990	1,813,271	873.79		139,482	67.21	0.003	7	0.003	2,851	1.37	0.28	577	0.28	0.28	2,274	1.10
	2000	1,901,308	848.66		146,254	65.28	0.002	5	0.002	2,927	1.31	0.19	429	0.19	0.19	2,499	1.12
	2019	1,143,697	798.19		87,977	61.40	0.000	0	0.000	1,438	1.00	0.02	31	0.02	0.02	1,407	0.98
	2019 vs. 2000 (%)	-39.85	-5.95		-39.85	-5.95	-88.75	-92.81	-88.75	-50.89	-23.21	-88.72	-92.79	-88.72	-88.72	-43.70	-11.97
15-49	1990	2,246,961	336.14		172,843	25.86	0.03	190	0.03	15,084	2.26	1.48	9,883	1.48	1.48	5,201	0.78
	2000	1,984,400	265.95		152,646	20.46	0.02	155	0.02	12,499	1.68	1.05	7,848	1.05	1.05	4,651	0.62
	2019	1,499,585	208.07		115,353	16.01	0.00	23	0.00	4,706	0.65	0.16	1,157	0.16	0.16	3,549	0.49
	2019 vs. 2000 (%)	-24.43	-21.77		-24.43	-21.77	-84.42	-84.96	-84.42	-62.35	-61.02	-84.74	-85.26	-84.74	-84.74	-23.68	-20.99
50-69	1990	118,008	76.60		9,078	5.89	0.20	302	0.20	9,437	6.13	5.94	9,147	5.94	5.94	290	0.19
	2000	145,119	75.92		11,163	5.84	0.12	232	0.12	7,358	3.85	3.66	7,001	3.66	3.66	357	0.19
	2019	281,470	76.30		21,652	5.87	0.02	66	0.02	2,647	0.72	0.53	1,955	0.53	0.53	692	0.19
	2019 vs. 2000 (%)	93.96	0.50		93.96	0.50	-85.31	-71.65	-85.31	-64.02	-81.36	-85.53	-72.08	-85.53	-85.53	94.06	0.56
70+	1990	42,656	111.50		3,281	8.58	0.37	142	0.37	2,410	6.30	6.03	2,306	6.03	6.03	104	0.27
	2000	63,037	114.76		4,849	8.83	0.25	139	0.25	2,382	4.34	4.06	2,227	4.06	4.06	154	0.28
	2019	133,562	123.71		10,274	9.52	0.05	54	0.05	1,129	1.05	0.75	805	0.75	0.75	324	0.30
	2019 vs. 2000 (%)	111.88	7.80		111.88	7.80	-80.37	-61.42	-80.37	-52.58	-75.87	-81.61	-63.86	-81.61	-81.61	110.54	7.12

Abbreviations: DALYs=disability-adjusted life years; YLLs=years of life lost; YLDs=years lived with disability.

\* Percent change (%) was calculated as difference value between 2019 and 2000 divided by quantity in 2000.



groups aged 50–69 years and 70 years or more; for acute hepatitis C (Table 4), percent changes in the number of person years of YLDs in groups aged <5 years, 15–49 years, 50–69 years, and 70 years or more were increased, and the standardized rate of YLDs in groups aged <5 years, 5–14 years, and 15–49 years were increased; and for acute hepatitis E (Table 5), percent changes of YLDs in groups aged 50–69 years and 70 years or more were increased.

## DISCUSSION

In China, the latest results showed that DALY standardized rates of acute hepatitis declined from 1990 to 2019 for males, females, and both genders combined. The decrease of DALYs primarily came from the decline of YLLs, and this was in line with the previous study (8). In 2019, acute hepatitis A, B, C, and E caused 3,726 deaths, 4,501,755 cases, and 214,165 person years of DALYs. Although DALYs decreased over 60% from 2000 to 2019, a high burden of acute hepatitis remains, and viral hepatitis remains a major public health challenge that requires an urgent response.

China implemented the nationwide use of a hepatitis A vaccine beginning in 1992, and the high burden of hepatitis A rapidly declined. The cause of the aforementioned percent changes in YLDs requires further investigation but were likely contributed to by factors such as unsafe water or food, poor sanitation, and poor personal hygiene and high-risk groups such as men who have sex with men, travelers to countries with high levels of infection, and persons who inject drugs (9). People aged 50 years or above in high-risk groups should get vaccinated as this is a safe and effective way available to prevent HAV infection.

Globally, in 2015, an estimated 257 million people were living with chronic HBV infection with 27 million people aware of their infection as of 2016 and 4.5 million of diagnosed people being on treatment (9). This report found that acute hepatitis B caused 2,888 deaths in 2019, accounting for 77.51% (2,888/3,726) of mortality of all acute hepatitis. Of those 2,888 deaths, people aged 50 years or above were responsible for the most deaths at 73.58% (2,125/2,888) of the total. Acute hepatitis B had the highest burden among all types of acute hepatitis, especially in the groups aged 15–49 years and 50–69 years. Prevention and control strategies for HBV infection prioritize vaccinations as the safe and effective

vaccine provides over a 98% protection against HBV infection.

The regions with the highest prevalence of hepatitis C were the Eastern Mediterranean Region and the European Region with estimated prevalences in 2015 of 2.3% and 1.5%, respectively (9). China had a relatively low prevalence of HCV infection, and the burden of acute hepatitis C was lower than that of acute hepatitis A or acute hepatitis E from our findings. Though no effective vaccine against HCV infection currently exists, antiviral medicine is effective for curing persons with HCV infection.

Hepatitis E was most common in East and South Asia, and HEV is transmitted by the fecal-oral route, primarily via contaminated water (9). In our report, acute hepatitis E caused 148 deaths, which outnumbered deaths due to acute hepatitis C in 2019 (90 deaths). The number of DALYs was 10,413 person years, which was greater than that of acute hepatitis C (3,581 person years). The hepatitis E vaccine has been developed and is licensed in China (4), and it should be used to control hepatitis E.

This study was subject to some limitations. First, large-scale seroprevalence data used for the estimation of morbidity of acute infections of hepatitis virus was limited, where data were sparse or no data, estimates were based on regional extrapolations and covariates by statistical models, which may lower spatial differences across regions and might deviate from the true value. Second, this report only presented results of incidence, prevalence, deaths, and burden indicators of acute hepatitis by gender for all acute hepatitis, and by age group for acute hepatitis A, B, C, and E at the national level; however, burdens of acute hepatitis A, B, C, and E at the provincial level and municipal level by gender and age group are necessary to make well-directed policy for the prevention and control of viral hepatitis.

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