Supplementary materials

Title: Assessing the effectiveness of the expanded hepatitis A vaccination program in China: An interrupted time series design

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Supplementary Methods
Table S1-4
Figure S1

Supplementary Methods

According to the levels of socioeconomic development, three regions were divided. The eastern region includes 9 provinces: Guangdong, Fujian, Zhejiang, Jiangsu, Shandong, Shanghai, Beijing, Tianjin, and Liaoning. The central region includes 10 provinces: Shanxi, Anhui, Jiangxi, Henan, Hubei, Hunan, Hainan, Jilin, Heilongjiang, and Hebei provinces. The western region includes 12 provinces: Inner Mongolia, Guangxi, Chongqing, Sichuan, Guizhou, Yunnan, Tibet, Shaanxi, Gansu, Qinghai, Ningxia, and Xinjiang. Data of HepA incidence was not available in Hongkong SAR, Macau SAR and Taiwan province.

Table S1 The DW value before adjusted

time series	DW value
China	0.705
Western Region	0.746
Central Region	0.948
Eastern Region	0.617
0~4	0.402
5~14	0.718
15~24	1.129
25~64	0.954
≥65	0.922
Beijing	1.162
Tianjin	1.296
Hebei	1.052
Shanxi	1.405
Inner mongoria	1.132
Liaoning	0.608
Jilin	1.097
Heilongjiang	1.521
Shanghai	1.265
Jiangsu	0.730
Zhejiang	0.946
Anhui	1.185
Fujian	1.265
Jiangxi	0.736

Shandong	1.124
Henan	0.870
Hubei	1.039
Hunan	1.215
Guangdong	1.148
Guangxi	1.349
Hainan	1.537
Chongqing	1.228
Sichuan	1.764
Guizhou	0.440
Yunnan	0.775
Tibet	0.643
Shaanxi	1.427
Gansu	0.455
Qinghai	1.192
Ningxia	0.660
Xinjiang	0.448

Abbreviation: DW, Durbin-Watson.

Table S2 The DW value after adjusted

time series	DW value
China	2.427
Western Region	2.285
Central Region	2.301
Eastern Region	2.413
0~4	2.056
5~14	2.052
15~24	2.108
25~64	2.408
≥65	2.091
Beijing	2.171
Tianjin	2.037
Hebei	2.142
Shanxi	2.164
Inner mongoria	2.105
Liaoning	2.411
Jilin	2.151
Heilongjiang	2.143
Shanghai	2.123
Jiangsu	2.217
Zhejiang	2.118
Anhui	2.161
Fujian	2.138
Jiangxi	2.371

Shandong	2.054
Henan	2.369
Hubei	2.158
Hunan	2.074
Guangdong	2.122
Guangxi	2.199
Hainan	2.095
Chongqing	2.103
Sichuan	2.004
Guizhou	2.346
Yunnan	2.240
Tibet	2.267
Shaanxi	2.091
Gansu	2.272
Qinghai	2.032
Ningxia	2.251
Xinjiang	2.033

Abbreviation: DW, Durbin-Watson.

Table S3 Value of different variables

region	year	month	time	*intervention*	*pretime*	*posttime*
China	2004	1-12	1-12	0	1-12	0
China	2005	1-12	13-24	0	13-24	0
China	2006	1-12	25-36	0	25-36	0
China	2007	1-12	37-48	0	27-48	0
China	2008	1-12	49-60	1	49	0-11
China	2009	1-12	61-72	1	49	12-23
China	2010	1-12	73-84	1	49	24-35
China	2011	1-12	85-96	1	49	36-47
China	2012	1-12	97-108	1	49	48-59
China	2013	1-12	109-120	1	49	60-71
China	2014	1-12	121-132	1	49	72-83
China	2015	1-12	133-144	1	49	84-95
China	2016	1-12	145-156	1	49	96-107
China	2017	1-12	157-168	1	49	108-119
China	2018	1-12	169-180	1	49	119-131

Table S4 The result of ITS analysis of 31 provinces in China

Province	**Variable**	***RR***	**95% *CI*** [*]	**Trend** [**]
Beijing	*intervention*	0.543	0.388 to 0.759	
	pretime	0.984	0.973 to 0.994	Decrease slower
	posttime	0.996	0.994 to 0.998	
Tianjin	*intervention*	0.396	0.198 to 0.792	
	pretime	0.983	0.962 to 1.005	No statistical significance

	posttime	1.003	0.999 to 1.008	
Hebei	*intervention*	0.670	0.580 to 0.774	
	pretime	0.992	0.988 to 0.997	Decrease faster
	posttime	0.992	0.991 to 0.993	
Shanxi	*intervention*	0.746	0.629 to 0.884	
	pretime	0.990	0.985 to 0.995	Increase
	posttime	1.004	1.003 to 1.005	
Inner mongoria	*intervention*	0.582	0.462 to 0.733	
	pretime	0.986	0.979 to 0.994	Decrease faster
	posttime	0.992	0.991 to 0.994	
Liaoning	*intervention*	0.902	0.683 to 1.191	
	pretime	0.976	0.967 to 0.985	No statistical significance
	posttime	1.001	0.999 to 1.003	
Jilin	*intervention*	0.820	0.662 to 1.015	
	pretime	0.968	0.962 to 0.975	Decrease slower
	posttime	0.993	0.992 to 0.994	
Heilongjiang	*intervention*	0.765	0.629 to 0.930	
	pretime	0.969	0.963 to 0.975	Decrease slower
	posttime	0.996	0.995 to 0.997	
Shanghai	*intervention*	0.684	0.524 to 0.892	
	pretime	0.983	0.975 to 0.991	No statistical significance
	posttime	0.999	0.997 to 1.000	
Jiangsu	*intervention*	0.799	0.690 to 0.925	
	pretime	0.986	0.982 to 0.991	Decrease slower
	posttime	0.990	0.989 to 0.991	
Zhejiang	*intervention*	0.632	0.529 to 0.755	
	pretime	0.984	0.978 to 0.989	Decrease slower
	posttime	0.990	0.988 to 0.991	
Anhui	*intervention*	0.976	0,838 to 1.137	
	pretime	0.983	0.978 to 0.988	Decrease slower
	posttime	0.991	0.990 to 0.992	
Fujian	*intervention*	1.056	0.905 to 1.231	
	pretime	0.983	0.978 to 0.987	Decrease slower
	posttime	0.991	0.990 to 0.992	
Jiangxi	*intervention*	0.549	0.458 to 0.658	
	pretime	0.989	0.984 to 0.995	Decrease faster
	posttime	0.984	0.983 to 0.985	
Shandong	*intervention*	0.768	0.622 to 0.947	
	pretime	0.973	0.967 to 0.980	Decrease slower
	posttime	0.998	0.997 to 0.999	
Henan	*intervention*	1.174	0.990 to 1.392	
	pretime	0.994	0.989 to 0.999	Decrease faster
	posttime	0.971	0.970 to 0.972	
Hubei	*intervention*	0.858	0.751 to 0.981	

	pretime	0.988	0.984 to 0.992	Decrease slower
	posttime	0.993	0.992 to 0.993	
Hunan	*intervention*	0.616	0.517 to 0.733	
	pretime	1.000	0.995 to 1.006	Decrease faster
	posttime	0.998	0.990 to 0.993	
Guangdong	*intervention*	0.919	0.819 to 1.031	
	pretime	0.998	0.990 to 0.997	Decrease slower
	posttime	0.998	0.998 to 0.999	
Guangxi	*intervention*	0.785	0.636 to 0.969	
	pretime	0.998	0.991 to 1.004	Decrease faster
	posttime	0.992	0.990 to 0.993	
Hainan	*intervention*	0.791	0.581 to 1.078	
	pretime	0.984	0.967 to 9.986	Decrease slower
	posttime	0.993	0.981 to 0.985	
Chongqing	*intervention*	0.756	0.652 to 0.877	
	pretime	0.984	0.980 to 0.989	Decrease slower
	posttime	0.993	0.992 to 0.993	
Sichuan	*intervention*	0.756	0.759 to 0.983	
	pretime	0.984	0.985 to 0.993	Decrease slower
	posttime	0.993	0.990 to 0.992	
Guizhou	*intervention*	0.774	0.638 to 0.939	
	pretime	1.005	0.999 to 1.011	Decrease faster
	posttime	0.974	0.973 to 0.975	
Yunnan	*intervention*	0.532	0.452 to 0.628	
	pretime	1.009	1.003 to 1.014	Decrease faster
	posttime	0.986	0.985 to 0.987	
Tibet	*intervention*	0.859	0.617 to 1.195	
	pretime	0.995	0.988 to 0.992	Decrease faster
	posttime	0.990	0.775 to 0.947	
Shaanxi	*intervention*	0.889	0.749 to 1.057	
	pretime	0.986	0.981 to 0.991	Decrease slower
	posttime	0.987	0.986 to 0.988	
Gansu	*intervention*	0.953	0.811 to 1.121	
	pretime	0.993	0.988 to 0.999	Decrease faster
	posttime	0.983	0.982 to 0.984	
Qinghai	*intervention*	0.904	0.727 to 1.125	
	pretime	1.003	0.996 to 1.010	Decrease faster
	posttime	0.992	0.990 to 0.993	
Ningxia	*intervention*	0.520	0.376 to 0.718	
	pretime	1.011	1.000 to 1.021	Decrease faster
	posttime	0.982	0.980 to 0.984	
Xinjiang	*intervention*	0.354	0.287 to 0.437	
	pretime	1.021	1.014 to 1.028	Decrease faster
	posttime	0.997	0.995 to 0.998	

*:*CI* is the confidence interval.
**: The change in the trend of HepA incidence between before and after EHAP.
Abbreviation: HepA, hepatitis A; EHAP, expanded HepA vaccination program; ITS, interrupted time series.

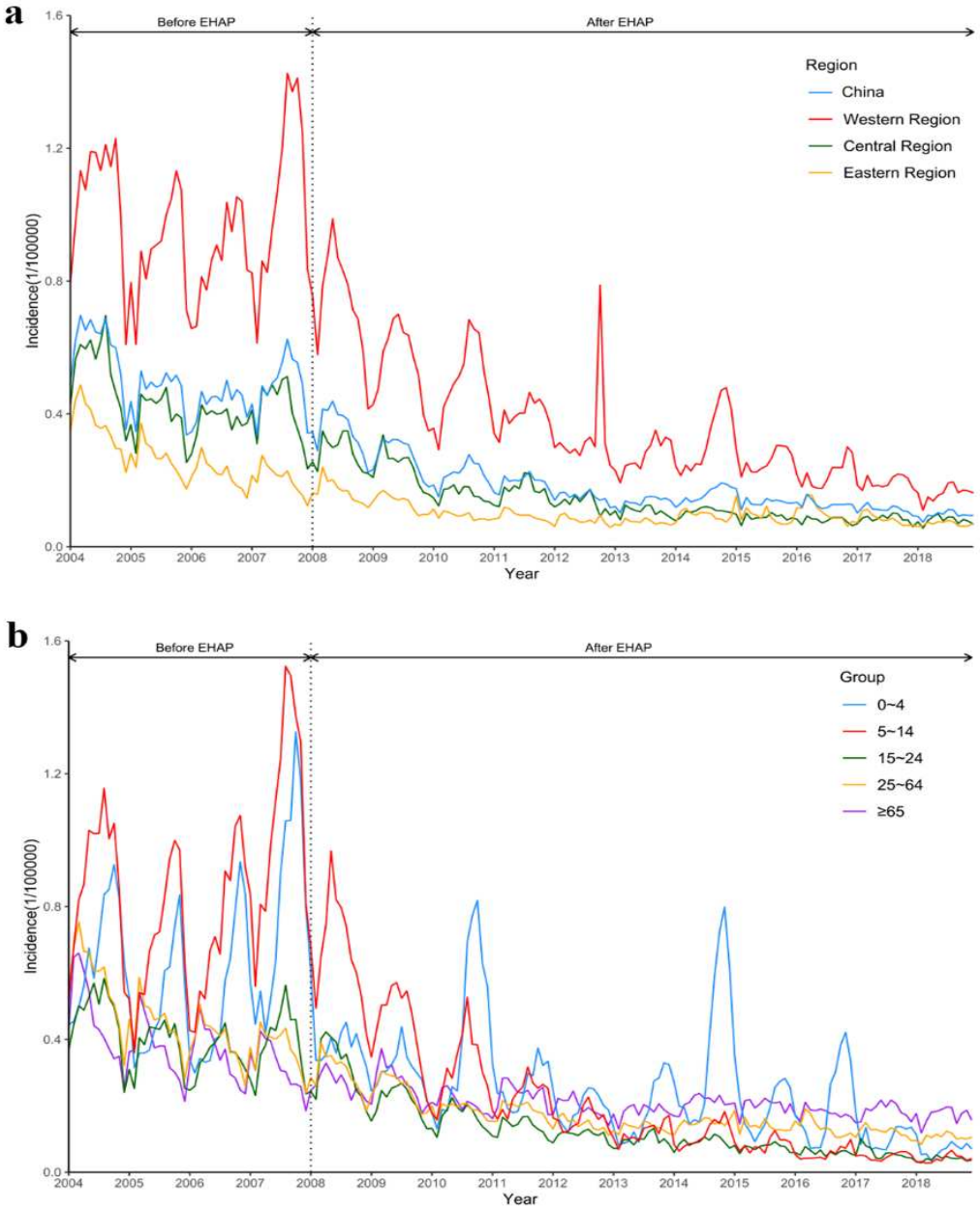

Figure S1 The trends in the HepA incidence in China, three economic regions, and five age groups from 2004 to 2018.(a) China and three economic regions. (b) Five age groups.
Abbreviation: HepA, hepatitis A.