Appendix

A1. Model Parameterization and Validation

The screening costs for Hepatitis C were estimated based on the medical claims data using test codes of C4871, C4872, C7487, and C4873 for antibody tests and CY424, CY425 and CY4424 for RNA tests (Table 1).[1]

Table A1 The current status of DAAs approved in Korea

DAAs	Drug name	Manufacturer	Genotype	Country	Commercial Approval Year/Month	Listing on NHI Year/ Month	Price Before Listing (For 12 Weeks)	Price After Listing (For 12 Weeks)
Daclatasvir	Daklinza	Bristol Myers	1b	Korea	2015/4	2015/8	4410.25	2976.55
Asunaprevir	Sunvepra	Bristol Myers	1b	Korea	2015/4	2015/8	1107.20	746.15
Sofosbuvir	Sovaldi	Gilead	2	Korea	2015/9	2016/5	32571.70	19594.70
Ledipasvir / sofosbuvir	Harvoni	Gilead	1 (non 1b)	Korea	2015/10	2016/5	39640.00	25856.00

Note:We used the OECD 2016 exchange rate [2] to convert Korean won to US dollars (KRW 1160)

We calibrated the model by simulating the model from 1950 to 2015, setting historical incidence rates (in 10-year intervals) and adjusting disease progression rates relative to those used by Razavi and others [3] to match the data on prevalence and mortality for Korea in 2015 [4 5]. The parameter describing spontaneous recovery following infection was set at 0.45 to match available estimates on the prevalence of Hepatitis C suggesting that about one half of and antibody-positive people were also chronically infected [4 5].

Following model validation by matching the model's estimated prevalence rate and mortality rate with the actual data in 2015, we reset the starting point of our model to start in 2015 and

projected the model from 2015 to 2050 by age, sex and population category (A or B) based on the access to general health screening by Korea Health Screening Program [6]. We used health insurance claim data on DAA treatment in 2015 and 2016 [1] and estimated the number of people who were likely to receive screening and treatment in 2017, the starting point of our policy analysis.

Table A2.1 Epidemiologic figures of Hepatitis C under different policy scenarios by population categories with transition rate of 5%

	2017	2020	2025	2030	2040	2050
A. Number of people chronically infected with Hepatitis C						
Total						
No treatment	63,409	63,719	63,206	61,306	53,896	43,631
Status quo	63,409	52,220	39,562	29,597	16,560	9,004
Screening from age 60	63,409	44,451	35,256	27,271	15,826	8,718
Screening from age 40	63,409	35,108	29,197	23,417	14,251	8,083
Screening from age 20	63,409	32,444	27,491	22,318	13,746	7,849
Type A						
No treatment	32,097	36,086	39,469	40,229	36,917	30,359
Status quo	32,097	27,439	21,357	16,163	9,303	5,333
Screening from age 60	32,097	20,643	18,174	14,612	8,875	5,177
Screening from age 40	32,097	12,502	13,710	12,013	7,895	4,805
Screening from age 20	32,097	9,897	12,196	11,155	7,569	4,663
Type B						
No treatment	31,312	27,634	23,737	21,077	16,978	13,272
Status quo	31,312	24,781	18,204	13,434	7,257	3,671
Screening from age 60	31,312	23,808	17,082	12,659	6,951	3,541
Screening from age 40	31,312	22,605	15,487	11,405	6,356	3,278
Screening from age 20	31,312	22,547	15,295	11,163	6,177	3,186
B. Number of deaths from Hepatitis C						
Total						
No treatment	1,238	988	895	937	937	685
Status quo	1,232	946	757	684	525	283
Screening from age 60	1,228	926	726	657	513	279
Screening from age 40	1,227	918	707	629	477	253
Screening from age 20	1,227	918	707	627	474	248
Type A						
No treatment	916	727	662	698	701	513
Status quo	914	707	571	517	396	213
Screening from age 60	910	689	544	495	387	210
Screening from age 40	909	682	529	472	358	190
Screening from age 20	909	681	528	470	356	187
Type B						
No treatment	323	261	233	239	236	172
Status quo	318	239	186	168	129	70
Screening from age 60	318	237	182	162	127	69
Screening from age 40	318	237	179	157	118	63
Screening from age 20	318	237	179	157	118	61

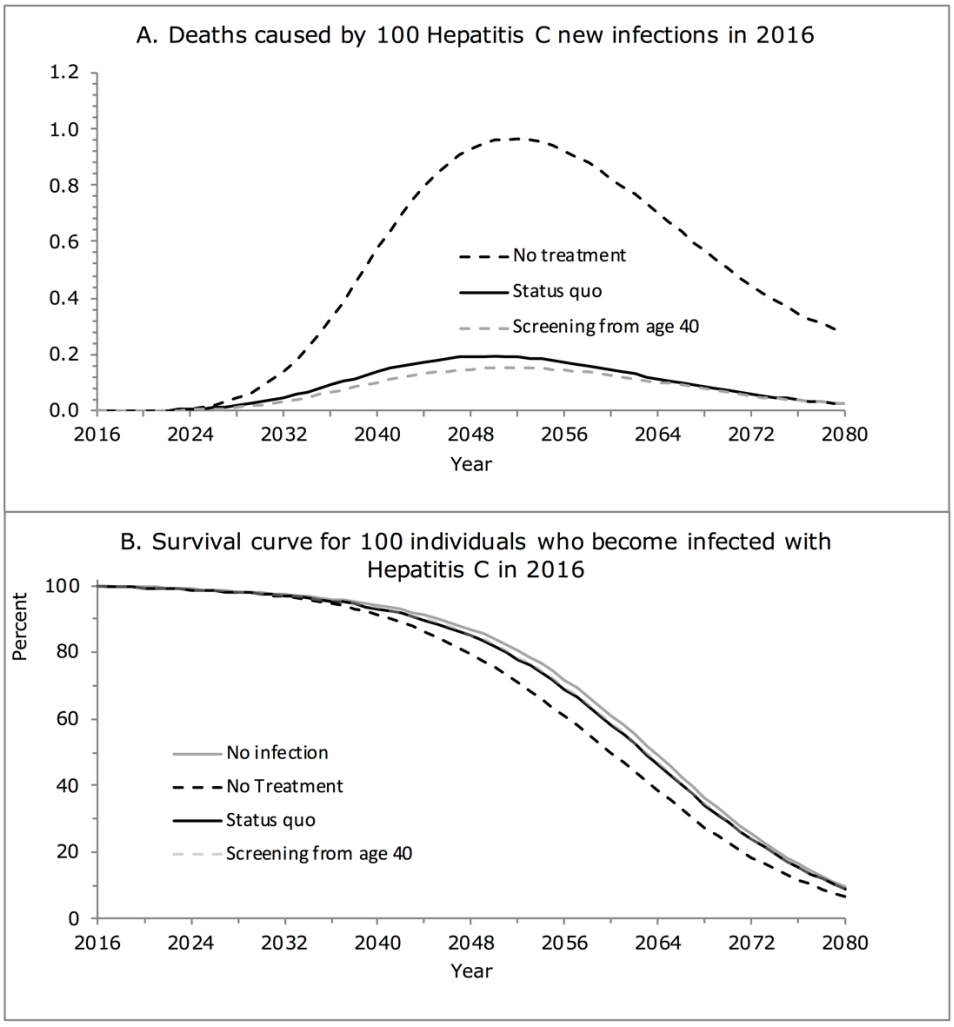
Table A2.2 Epidemiologic figures of Hepatitis C under different policy scenarios by population categories with transition rate of 10%

	2017	2020	2025	2030	2040	2050
A. Number of people chronically infected with Hepatitis C						
Total						
No treatment	63,394	63,705	63,192	61,292	53,884	43,624
Status quo	63,394	52,079	38,814	28,615	15,713	8,431
Screening from age 60	63,394	43,485	34,080	26,091	14,950	8,139
Screening from age 40	63,394	33,335	27,470	21,930	13,325	7,508
Screening from age 20	63,394	30,672	25,759	20,822	12,824	7,284
Type A						
No treatment	33,994	38,325	40,663	40,943	37,393	30,712
Status quo	33,994	29,331	22,092	16,358	9,239	5,258
Screening from age 60	33,994	22,394	18,697	14,634	8,770	5,091
Screening from age 40	33,994	14,249	13,963	11,758	7,708	4,703
Screening from age 20	33,994	11,649	12,469	10,903	7,375	4,560
Type B						
No treatment	29,401	25,380	22,528	20,349	16,491	12,912
Status quo	29,401	22,748	16,721	12,257	6,474	3,173
Screening from age 60	29,401	21,091	15,383	11,456	6,180	3,049
Screening from age 40	29,401	19,087	13,507	10,172	5,617	2,805
Screening from age 20	29,401	19,023	13,290	9,919	5,449	2,723
B. Number of deaths from Hepatitis C						
Total						
No treatment	1,238	988	895	937	936	684
Status quo	1,233	949	759	683	518	277
Screening from age 60	1,228	926	726	654	506	273
Screening from age 40	1,227	917	706	624	467	244
Screening from age 20	1,227	917	705	623	464	239
Type A						
No treatment	920	737	670	702	702	513
Status quo	919	713	572	515	390	208
Screening from age 60	914	693	546	492	380	205
Screening from age 40	913	686	530	469	351	183
Screening from age 20	913	686	529	468	348	180
Type B						
No treatment	318	251	225	235	234	171
Status quo	314	236	187	168	128	69
Screening from age 60	314	233	180	162	125	68
Screening from age 40	314	232	176	155	116	60
Screening from age 20	314	232	176	155	115	59

Table A2.3 Epidemiologic figures of Hepatitis C under different policy scenarios by population categories with transition rate of 0%

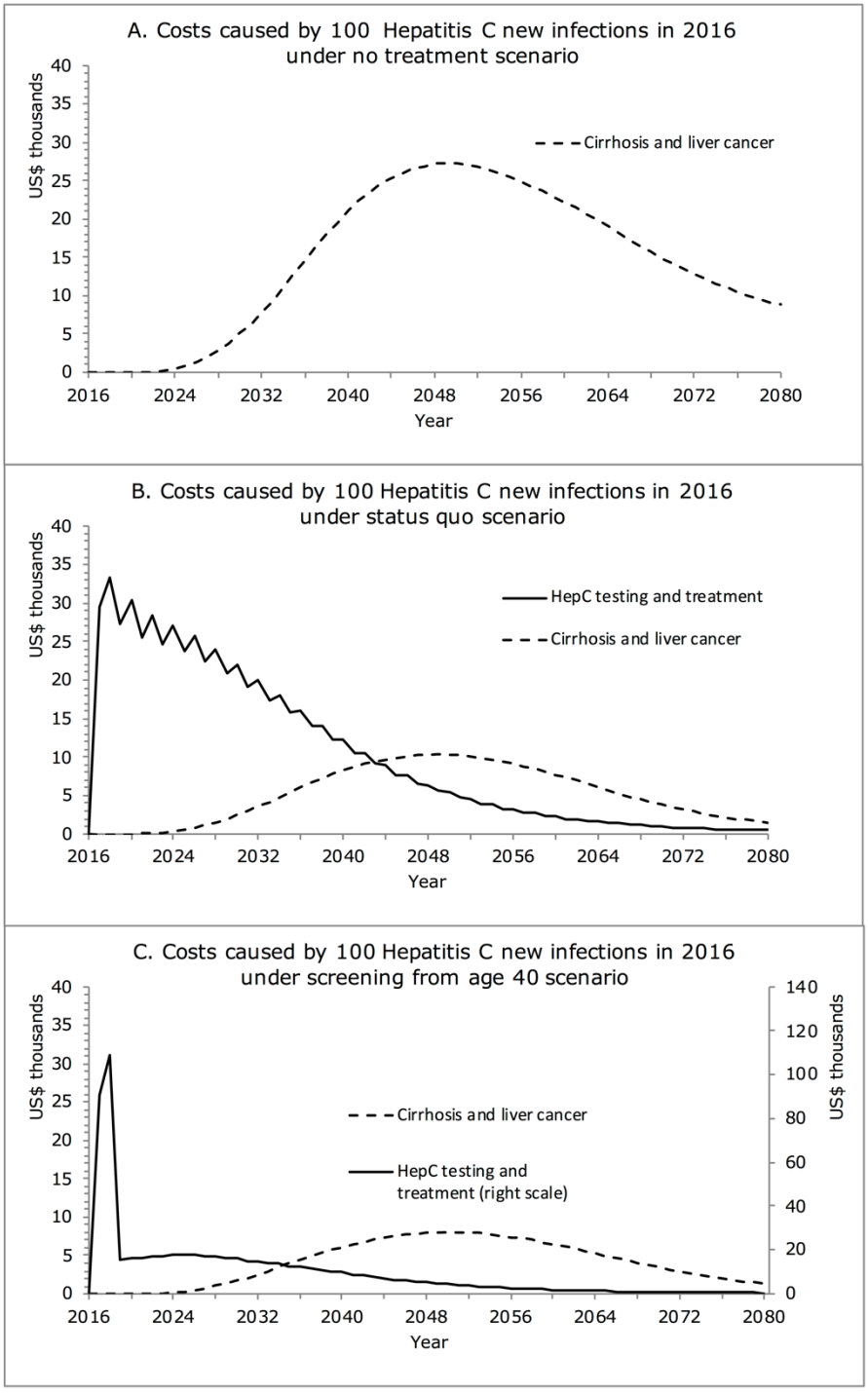
	2017	2020	2025	2030	2040	2050
A. Number of people chronically infected with Hepatitis C						
Total						
No treatment	63,423	63,734	63,220	61,320	53,906	43,639
Status quo	63,423	52,408	41,093	32,319	20,165	12,146
Screening from age 60	63,423	45,716	37,417	30,381	19,523	11,847
Screening from age 40	63,423	37,420	32,190	27,196	18,240	11,285
Screening from age 20	63,423	34,756	30,491	26,123	17,761	11,056
Type A						
No treatment	29,936	31,025	32,461	32,809	30,240	25,221
Status quo	29,936	23,373	17,029	12,393	6,904	3,920
Screening from age 60	29,936	16,820	13,688	10,855	6,594	3,833
Screening from age 40	29,936	8,693	8,884	8,204	5,798	3,603
Screening from age 20	29,936	6,082	7,321	7,303	5,480	3,488
Type B						
No treatment	33,487	32,709	30,759	28,511	23,666	18,418
Status quo	33,487	29,036	24,064	19,926	13,261	8,226
Screening from age 60	33,487	28,896	23,729	19,526	12,929	8,014
Screening from age 40	33,487	28,727	23,305	18,993	12,442	7,682
Screening from age 20	33,487	28,673	23,170	18,821	12,281	7,569
B. Number of deaths from Hepatitis C						
Total						
No treatment	1,238	988	895	937	937	685
Status quo	1,231	941	749	678	530	298
Screening from age 60	1,228	925	721	652	519	295
Screening from age 40	1,227	919	704	624	485	273
Screening from age 20	1,227	919	703	622	482	268
Type A						
No treatment	910	703	602	608	590	420
Status quo	909	694	552	494	361	178
Screening from age 60	906	678	524	468	351	177
Screening from age 40	905	671	507	440	318	157
Screening from age 20	905	671	506	439	315	153
Type B						
No treatment	328	285	293	329	347	265
Status quo	322	247	196	184	169	120
Screening from age 60	322	247	196	184	168	118
Screening from age 40	322	247	196	184	167	116
Screening from age 20	322	247	196	184	167	116

Figure A1 Life cycle perspective on survival of new Hepatitis C infections under different policy scenarios



Note: New infection distributed across sexes and from age 20 to 50 in proportion to population size. The curve for screening from age 40 in panel B is to the right of but very close to the curve for the status quo scenario.

Figure A2 Life cycle perspective on costs of new Hepatitis C infections under different policy scenarios



Note: New infection distributed across sexes and from age 20 to 50 in proportion to population size.

References

1. Health Insurance Review & Assessement Service. Healthcare Bigdata Hub Health Insurance Review & Assessement Service, ; 2017 [Available from: http://opendata.hira.or.kr/op/opc/olapMfrnIntrsIlnsInfo.do.
2. OECD. Exchange rates 2016 [Available from: https://data.oecd.org/conversion/exchange-rates.htm.
3. Razavi H, Waked I, Sarrazin C, et al. The present and future disease burden of hepatitis C virus (HCV) infection with today's treatment paradigm. *Journal of viral hepatitis* 2014;21(s1):34-59.
4. Statistics Korea. Causes of Death Statistics of 2015, 2016.
5. Korea Centers for Disease Control and Prevention. Korea National Health and Nutrition Examination Survey (KNHANES), 2015.
6. National Health Insurance Service. 2015 National Health Screening Statistical Yearbook, 2015.