Supplementary material

National Health Insurance Expenditure and Health-System Use for Hepatitis B and C in Bulgaria, 2021–2025

Primary analyses use complete years 2021–2025 for reimbursement and 2024–2025 for service activity. Tables S1–S16 and Figures S1–S5 retain the source windows stated in their captions for descriptive context; their partial-year totals are not compared with complete-year totals. Pharmacy data for 2020 and 2026 cover July–December and January–June, respectively. Service data for 2026 cover January–July. Table S17 and the additional Tables S20–S23 distinguish primary analyses from full-window analyses.

Supplementary methods

Case definition in full

Records were extracted on the ICD-10 code as published in the source datasets and assigned to a virus group as follows.

Group	ICD-10 codes	Treatment in the analysis
Hepatitis B	B16, B16.0, B16.1, B16.2, B16.9, B17.0, B18.0, B18.1	Reported as hepatitis B
Hepatitis C	B17.1, B18.2	Reported as hepatitis C
Unspecified viral hepatitis	B18, B18.8, B18.9, B19, B19.0, B19.9, Z22.5	Reported separately; never attributed to a virus
Other viral hepatitis	B15, B15.0, B15.9, B17, B17.2, B17.8, B17.9	Extracted for contrast only; hepatitis A and E

ICD-10 case definition. B19.1 and B19.2, which appear in some published hepatitis code lists, are ICD-10-CM codes with no counterpart in the WHO ICD-10 that the Bulgarian classification follows, and do not occur in these data.

Stage was assigned from the code itself: B15, B16 and B17 are acute, B18 is chronic, B19 is unspecified and Z22.5 is carriage.

The drug-identified arm selects K74.0 (hepatic fibrosis) or K74.6 (other and unspecified cirrhosis of liver) together with an eligible hepatitis antiviral product. Fibrosis or cirrhosis alone is insufficient for viral assignment. The NHIF hepatitis treatment requirements support the prescribing context [26,27], but product-based assignment remains an administrative algorithm

without validation against clinical records. Some medicines have indications beyond a single hepatitis virus. Record-level overlap between the arms is prevented by their disjoint diagnosis-code definitions. Administrative shifts between hepatitis and liver-disease coding can change the arm distribution without a true change in infection burden.

Assigned to	ATC codes	Products
Hepatitis B	J05AF05, J05AF07, J05AF10, J05AF11, L03AB11	lamivudine, tenofovir disoproxil, entecavir, telbivudine, peginterferon alfa-2a; assignment follows the algorithm and prescribing context, not exclusive molecular indications
Hepatitis C	J05AP, *J05AX6*, J05AB04	the direct-acting antiviral regimens and ribavirin

Assignment of virus from the prescribed product in the drug-identified arm.

Peginterferon alfa-2a has historically been used for HBV and HCV. It is assigned to HBV here on the basis of the NHIF prescribing context and its observed diagnosis pattern; no peginterferon record carries an HCV diagnosis in the supplied extract. This assumption does not demonstrate virus specificity. Reimbursement in its drug-identified arm was EUR 25,742 in the full window and EUR 21,219 during 2021–2025. Table S22 shows the effect of excluding these records, alongside a diagnosis-only definition.

Medicines were classified as antiviral where the ATC code begins J05 or equals L03AB11 (peginterferon alfa-2a), and adjunctive otherwise. Adjunctive products reimbursed under a hepatitis diagnosis were silymarin (A05BA03), ademetionine (A16AA02) and ornithine-aspartate (A05BA).

Treatment course definitions

For oral HBV nucleos(t)ide analogues, dispensed patient-month equivalents equal packages × tablets per package ÷ 30.4, assuming one tablet daily. Dividing by the number of observed months gives the mean continuous-therapy equivalent; the complete-year analysis divides by 12. Peginterferon is not included in this conversion. For HCV, direct-acting antiviral packages are divided by the regimen-specific package requirements shown below. Ribavirin packages are not counted as separate HCV courses, although their reimbursement remains in antiviral expenditure. These measures cannot identify unique patients, treatment initiation, completion, or cure.

Regimen	ATC	Standard duration	Permitted duration	Standard packages	Sensitivity range
glecaprevir/pibrentasvir	J05AP57	8 weeks	8 to 16 weeks	2	2 to 4
sofosbuvir/velpatasvir	J05AP55 (formerly J05AX69)	12 weeks	12 weeks	3	3
elbasvir/grazoprevir	J05AP54 (formerly J05AX68)	12 weeks	12 to 16 weeks	3	3 to 4
sofosbuvir/velpatasvir/voxilaprevir	J05AP56	12 weeks	12 weeks	3	3
ledipasvir/sofosbuvir	J05AP51 (formerly J05AX65)	12 weeks	8 to 24 weeks	3	2 to 6

Definitions used to convert dispensed packages into standard-course equivalents. The sensitivity range incorporates permitted regimen durations and does not represent statistical uncertainty. The resulting values are neither unique-patient counts nor confirmed cures.

Treatment interruptions, non-adherence, stockpiling, switches, retreatment, incomplete courses, and dispensing across year boundaries are unobservable. The duration range addresses alternative regimen lengths only, and is not a confidence interval or a measure of all uncertainty. Dispensing can overstate completed therapy; supplies outside NHIF reimbursement are excluded. The HBV mean describes ongoing treatment, whereas HCV course equivalents describe finite-course dispensing.

Fisher decomposition

For a pair of years 0 and 1, let p_i and q_i be the unit value and quantity of product i, and let M be the set of products present in both years. The Laspeyres and Paasche price indices on the matched sample are

$$P_L = \frac{\sum_{i \in M} p_{i1}\, q_{i0}}{\sum_{i \in M} p_{i0}\, q_{i0}}, \qquad P_P = \frac{\sum_{i \in M} p_{i1}\, q_{i1}}{\sum_{i \in M} p_{i0}\, q_{i1}} \qquad \text{(S1)}$$

and the Fisher price index is their geometric mean, $P_F = \sqrt{P_L P_P}$; the quantity indices Q_L, Q_P and Q_F are defined symmetrically. Writing V for total expenditure and V^M for expenditure on the matched sample, the entry-and-exit factor is

$$E = \frac{V_1 / V_0}{V_1^M / V_0^M} \qquad \text{(S2)}$$

so that $V_1/V_0 = P_F \times Q_F \times E$ exactly. The implementation was checked on synthetic panels before use: a panel in which one product's price doubles with quantity held constant must return $P_F = 2$, $Q_F = 1$ and $E = 1$, and a panel with an entrant in the comparison year must satisfy the multiplicative identity to machine precision. Package size was verified constant within every NHIF product code, so a change in unit value is a change in price and not a change in pack size.

Data quality

ATC reclassification. The WHO moved the direct-acting antivirals from J05AX to J05AP during 2024, so three NHIF product codes carry one ATC code before the change and another after it while remaining the same product. Each product code takes the most recent ATC code observed for it, so molecule-level indices do not read the reclassification as simultaneous exit and entry. This is a property of the classification, not a deposit defect, and the handling remains necessary.

Residual quality. Within the hepatitis subset there are no negative reimbursement amounts, no zero-package records and no diagnosis code that fails to classify, and package size is constant within every NHIF product code — which is what makes the unit-value panel behind the Fisher decomposition legitimate. One product code carries a missing package size and contributes EUR 499 across seven records; it is excluded from the people-on-therapy conversion and retained elsewhere.

Supplementary tables

Table S1. Distribution of expenditure, hospital admissions and outpatient consultations across the ICD-10 case definition. Codes that do not identify a virus are reported here and are never attributed to hepatitis B or C in the main analysis.

Source	Virus group	Stage	Value	Share of source, %
Hospitalisations, primary diagnosis (cases)	HBV	Acute	399	1.0
	HBV	Chronic	31,870	78.3
	HCV	Acute	106	0.3
	HCV	Chronic	5,319	13.1
	Other viral hepatitis	Acute	1,741	4.3
	Unspecified	Chronic	60	0.1
	Unspecified	Unspecified	1,231	3.0
Outpatient consultations (visits)	HBV	Acute	995	1.5

Source	Virus group	Stage	Value	Share of source, %
	HBV	Chronic	45,237	66.6
	HCV	Acute	323	0.5
	HCV	Chronic	10,819	15.9
	Other viral hepatitis	Acute	1,983	2.9
	Unspecified	Carriage	2,014	3.0
	Unspecified	Chronic	4,923	7.2
	Unspecified	Unspecified	1,658	2.4
Pharmacy expenditure (EUR)	HBV	Chronic	12,507,255	10.3
	HCV	Chronic	109,378,661	89.7

Table S2. Every antiviral product in the HBV/HCV case definition, including diagnosis- and drug-identified arms, July 2020–June 2026. This full-window inventory is descriptive. Product absence for the final six months is labelled withdrawn from the observed series, without implying formal withdrawal of marketing authorisation. Exact NHIF codes and historical ATC mappings are in Table S21.

Virus	Active substance	ATC	Brand	Strength	Pack size	First month	Last month	Packages	Reimbursement, EUR	Cost per package, EUR	Status
HBV	entecavir	J05AF10	Entecavir Pharmascience International Ltd	0.5 mg	30	2020-07	2026-06	4,916	301,225	61	Present throughout
HBV	entecavir	J05AF10	Entecavir Alvogen	0.5 mg	30	2020-07	2023-02	3,941	228,199	58	Present at baseline, withdrawn
HBV	entecavir	J05AF10	Baraclude	0.5 mg	30	2020-07	2024-04	427	24,933	58	Present at baseline, withdrawn
HBV	entecavir	J05AF10	Entecavir Accord	0.5 mg	30	2020-07	2023-08	38	2,201	58	Present at baseline, withdrawn
HBV	entecavir	J05AF10	Entecavir Zentiva	0.5 mg	30	2023-03	2026-06	7,814	493,623	63	Entrant, still supplied

Virus	Active substance	ATC	Brand	Strength	Pack size	First month	Last month	Packages	Reimbursement, EUR	Cost per package, EUR	Status
HBV	lamivudine	J05AF05	Zeffix	100 mg	28	2020-07	2026-06	22,354	530,847	24	Present throughout
HBV	peginterferon alfa-2a	L03AB11	Pegasys	180 mcg-0.5 ml	1	2020-07	2026-06	1,450	229,739	158	Present throughout
HBV	telbivudine	J05AF11	Sebivo	600 mg	28	2020-07	2021-01	390	155,828	400	Present at baseline, withdrawn
HBV	tenofovir disoproxil	J05AF07	Tenofovir Disoproxil Mylan	245 mg	30	2020-07	2025-04	97,886	6,979,299	71	Present at baseline, withdrawn
HBV	tenofovir disoproxil	J05AF07	Tenofovir Disoproxil Zentiva	245 mg	30	2020-07	2026-06	18,554	1,302,386	70	Present throughout
HBV	tenofovir disoproxil	J05AF07	Tenofovir Polpharma	245 mg	30	2020-07	2026-06	5,669	380,177	67	Present throughout
HBV	tenofovir disoproxil	J05AF07	Virofob	245 mg	30	2020-07	2022-05	866	71,401	82	Present at baseline, withdrawn
HBV	tenofovir disoproxil	J05AF07	Viread	245 mg	30	2020-07	2021-10	405	33,488	83	Present at baseline, withdrawn
HBV	tenofovir disoproxil	J05AF07	Tenofovir Disoproxil Accordpharma	245 mg	-	2023-11	2024-01	8	499	62	Entrant, since withdrawn
HBV	tenofovir disoproxil	J05AF07	Tenofovir Disoproxil Viatris	245 mg	30	2025-05	2026-06	23,164	1,556,970	67	Entrant, still supplied
HBV	tenofovir disoproxil	J05AF07	Tenofovir Zentiva	245 mg	30	2025-11	2026-06	2,020	143,772	71	Entrant, still supplied
HCV	elbasvir/grazoprevir	J05AP54	Zepatier	50mg/ 100mg	28	2020-07	2024-04	443	3,313,190	7,479	Present at baseline, withdrawn
HCV	glecaprevir/pibrentasvir	J05AP57	Maviret	100mg/40 mg	84	2020-07	2026-06	4,718	60,482,229	12,819	Present throughout
HCV	ledipasvir/sofosbuvir	J05AP51	Harvoni	90mg/400 mg	28	2020-07	2022-03	27	387,407	14,348	Present at baseline, withdrawn

Virus	Active substance	ATC	Brand	Strength	Pack size	First month	Last month	Packages	Reimbursement, EUR	Cost per package, EUR	Status
HCV	ribaverin	J05AB04	Copegus	200 mg	168	2020-07	2021-06	63	19,499	310	Present at baseline, withdrawn
HCV	ribaverin	J05AB04	Rebetol	200 mg	168	2020-07	2020-07	6	1,857	310	Present at baseline, withdrawn
HCV	sofosbuvir/velpatasvir	J05AP55	Epclusa	400 mg/100 mg	28	2020-07	2026-06	4,743	43,293,693	9,128	Present throughout
HCV	sofosbuvir/velpatasvir/voxilaprevir	J05AP56	Vosevi	400 mg/100mg/100mg	28	2020-07	2026-06	137	1,839,513	13,427	Present throughout

Table S3. Fisher decomposition repeated at molecule (ATC) level rather than product level, with the Laspeyres, Paasche and Törnqvist price indices shown alongside the Fisher index. The Törnqvist index reproduces the Fisher index to three decimal places throughout, which indicates that the result does not depend on the choice of index formula.

Basis	Virus	Comparison	Expenditure ratio	Fisher price index	Tornqvist price index	Laspeyres price index	Paasche price index	Fisher quantity index	Entry and exit factor
Fixed base	Hepatitis B	2021 to 2022	0.993	0.971	0.971	0.971	0.971	1.026	0.997
		2021 to 2023	0.860	0.784	0.784	0.785	0.783	1.101	0.997
		2021 to 2024	0.953	0.789	0.789	0.791	0.787	1.212	0.997
		2021 to 2025	1.083	0.799	0.799	0.800	0.798	1.360	0.997
	Hepatitis C	2021 to 2022	0.923	0.970	0.970	0.971	0.970	0.952	0.999
		2021 to 2023	1.180	0.943	0.943	0.943	0.944	1.267	0.987
		2021 to 2024	1.169	0.901	0.901	0.905	0.898	1.313	0.987
		2021 to 2025	1.157	0.885	0.885	0.884	0.886	1.447	0.903
Chai	Hep	2021 to 2022	0.993	0.971	0.971	0.971	0.971	1.026	0.997
		2022 to 2023	0.866	0.806	0.806	0.806	0.806	1.074	1.000

Basis	Virus	Comparison	Expenditure ratio	Fisher price index	Tornqvist price index	Laspeyres price index	Paasche price index	Fisher quantity index	Entry and exit factor
		2023 to 2024	1.108	1.006	1.006	1.007	1.006	1.101	1.000
		2024 to 2025	1.136	1.012	1.012	1.011	1.012	1.123	1.000
	Hepatitis C	2021 to 2022	0.923	0.970	0.970	0.971	0.970	0.952	0.999
		2022 to 2023	1.278	0.972	0.972	0.971	0.973	1.318	0.998
		2023 to 2024	0.991	0.956	0.956	0.956	0.956	1.036	1.000
		2024 to 2025	0.990	0.980	0.980	0.982	0.979	1.011	0.999

Table S4. Herfindahl-Hirschman index of reimbursement concentration, computed on cost shares at product and molecule level. Values above 2,500 are conventionally read as a highly concentrated market.

Level	Virus	Year	Products or molecules	Herfindahl-Hirschman index
Molecule (ATC)	Hepatitis B	2020	5	5,414
		2021	5	7,533
		2022	4	7,753
		2023	4	7,308
		2024	4	7,284
		2025	4	7,183
		2026	4	7,356
	Hepatitis C	2020	6	4,169
		2021	6	4,105
		2022	5	4,418
		2023	4	4,756
		2024	4	5,197

Level	Virus	Year	Products or molecules	Herfindahl-Hirschman index
		2025	3	4,899
		2026	3	5,113
Product (NHIF code)	Hepatitis B	2020	12	4,135
		2021	12	5,572
		2022	9	5,492
		2023	9	5,370
		2024	9	5,929
		2025	8	4,425
		2026	8	3,264
	Hepatitis C	2020	7	4,169
		2021	6	4,105
		2022	5	4,418
		2023	4	4,756
		2024	4	5,197
		2025	3	4,899
		2026	3	5,113

Table S5. HCV standard-course equivalents and direct-acting antiviral reimbursement per standard course, by regimen. † Partial years: July–December 2020 and January–June 2026. Duration ranges follow the supplementary methods and do not represent statistical uncertainty or unique patients.

Year	Regimen	Standard duration, weeks	Packages per standard course	Permitted package range	Standard-course equivalents (range)	Cost per package, EUR	Cost per standard course, EUR (range)
2020 †	elbasvir/grazoprevir	12	3	3 to 4	32.0 (24.0 to 32.0)	7,574	22,723 (22,723 to 30,297)
2021	elbasvir/grazoprevir	12	3	3 to 4	63.0 (47.2 to 63.0)	7,551	22,654 (22,654 to 30,206)
2022	elbasvir/grazoprevir	12	3	3 to 4	44.3 (33.2 to 44.3)	7,390	22,170 (22,170 to 29,559)
2023	elbasvir/grazoprevir	12	3	3 to 4	7.3 (5.5 to 7.3)	7,040	21,119 (21,119 to 28,158)
2024	elbasvir/grazoprevir	12	3	3 to 4	1.0 (0.8 to 1.0)	7,040	21,119 (21,119 to 28,158)
2020 †	glecaprevir/pibrentasvir	8	2	2 to 4	174.0 (87.0 to 174.0)	14,406	28,812 (28,812 to 57,624)
2021	glecaprevir/pibrentasvir	8	2	2 to 4	310.0 (155.0 to 310.0)	13,963	27,926 (27,926 to 55,852)
2022	glecaprevir/pibrentasvir	8	2	2 to 4	320.0 (160.0 to 320.0)	13,305	26,611 (26,611 to 53,221)
2023	glecaprevir/pibrentasvir	8	2	2 to 4	422.5 (211.2 to 422.5)	12,764	25,528 (25,528 to 51,057)

Year	Regimen	Standard duration, weeks	Packages per standard course	Permitted package range	Standard-course equivalents (range)	Cost per package, EUR	Cost per standard course, EUR (range)
2024	glecaprevir/pibrentasvir	8	2	2 to 4	500.5 (250.2 to 500.5)	12,199	24,399 (24,399 to 48,797)
2025	glecaprevir/pibrentasvir	8	2	2 to 4	412.0 (206.0 to 412.0)	12,124	24,248 (24,248 to 48,496)
2026 †	glecaprevir/pibrentasvir	8	2	2 to 4	220.0 (110.0 to 220.0)	12,066	24,132 (24,132 to 48,264)
2020 †	ledipasvir/sofosbuvir	12	3	2 to 6	3.7 (1.8 to 5.5)	14,406	43,218 (28,812 to 86,437)
2021	ledipasvir/sofosbuvir	12	3	2 to 6	4.7 (2.3 to 7.0)	14,321	42,962 (28,641 to 85,924)
2022	ledipasvir/sofosbuvir	12	3	2 to 6	0.7 (0.3 to 1.0)	14,226	42,677 (28,451 to 85,354)
2020 †	sofosbuvir/velpatasvir	12	3	3 to 3	90.7 (90.7 to 90.7)	9,538	28,613 (28,613 to 28,613)
2021	sofosbuvir/velpatasvir	12	3	3 to 3	220.3 (220.3 to 220.3)	9,538	28,613 (28,613 to 28,613)
2022	sofosbuvir/velpatasvir	12	3	3 to 3	204.0 (204.0 to 204.0)	9,472	28,415 (28,415 to 28,415)
2023	sofosbuvir/velpatasvir	12	3	3 to 3	300.7 (300.7 to 300.7)	9,395	28,185 (28,185 to 28,185)

Year	Regimen	Standard duration, weeks	Packages per standard course	Permitted package range	Standard-course equivalents (range)	Cost per package, EUR	Cost per standard course, EUR (range)
2024	sofosbuvir/velpatasvir	12	3	3 to 3	269.7 (269.7 to 269.7)	8,983	26,949 (26,949 to 26,949)
2025	sofosbuvir/velpatasvir	12	3	3 to 3	359.0 (359.0 to 359.0)	8,646	25,938 (25,938 to 25,938)
2026†	sofosbuvir/velpatasvir	12	3	3 to 3	136.7 (136.7 to 136.7)	8,646	25,938 (25,938 to 25,938)
2020†	sofosbuvir/velpatasvir/voxilaprevir	12	3	3 to 3	7.7 (7.7 to 7.7)	14,406	43,218 (43,218 to 43,218)
2021	sofosbuvir/velpatasvir/voxilaprevir	12	3	3 to 3	6.3 (6.3 to 6.3)	14,205	42,616 (42,616 to 42,616)
2022	sofosbuvir/velpatasvir/voxilaprevir	12	3	3 to 3	6.0 (6.0 to 6.0)	13,862	41,587 (41,587 to 41,587)
2023	sofosbuvir/velpatasvir/voxilaprevir	12	3	3 to 3	12.3 (12.3 to 12.3)	13,184	39,552 (39,552 to 39,552)

Year	Regimen	Standard duration, weeks	Packages per standard course	Permitted package range	Standard-course equivalents (range)	Cost per package, EUR	Cost per standard course, EUR (range)
2024	sofosbuvir/velpatasvir/voxilaprevir	12	3	3 to 3	5.7 (5.7 to 5.7)	12,636	37,907 (37,907 to 37,907)
2025	sofosbuvir/velpatasvir/voxilaprevir	12	3	3 to 3	5.7 (5.7 to 5.7)	12,485	37,455 (37,455 to 37,455)
2026 †	sofosbuvir/velpatasvir/voxilaprevir	12	3	3 to 3	2.0 (2.0 to 2.0)	12,315	36,944 (36,944 to 36,944)

Table S6. Hospital admissions in which hepatitis B or C was recorded as the secondary diagnosis, by primary discharge diagnosis, for diagnoses with at least 20 admissions. These admissions are reported separately throughout and are never added to admissions for hepatitis itself.

Virus recorded as secondary diagnosis	Primary discharge diagnosis (ICD-10)	Admissions
HBV	K74.6	3,029
HCV	K74.6	765
HBV	K76.0	364
HBV	K80.8	315
HBV	K82.8	303
HBV	Z94.4	248
HCV	D56.1	198
HCV	K76.0	173
HBV	D13.4	147

Virus recorded as secondary diagnosis	Primary discharge diagnosis (ICD-10)	Admissions
HCV	D66	132
HBV	C22.0	104
HBV	M45.0	100
HCV	K82.8	99
HBV	C83.3	96
HBV	M05.80	86
HBV	L40.0	77
HCV	K80.8	64
HBV	C90.0	56
HBV	K80.1	50
HBV	C91.1	45
HCV	D67	43
HBV	K51.8	38
Unspecified	C90.0	38
HBV	D18.0	37
Unspecified	J96.0	35
HBV	D56.1	32
HBV	M51.1	32
HCV	M45.0	32
HCV	D13.4	31
HBV	C50.4	29
HBV	C82.0	29
HBV	K50.0	28
HCV	L40.0	28
HBV	E11.4	27

Virus recorded as secondary diagnosis	Primary discharge diagnosis (ICD-10)	Admissions
HCV	C22.0	25
HBV	C78.7	24
HBV	L40.5	22
HBV	C82.7	21
HBV	R40.0	21
Unspecified	K74.6	21
HBV	J15.8	20
HBV	K72.0	20
Unspecified	M51.1	20

Table S7. Clinical pathways, ambulatory procedures and clinical procedures under which hepatitis admissions were billed, for codes accounting for at least 0.3% of admissions. "A" codes are ambulatory procedures, "P" codes clinical pathways and "K" codes clinical procedures; the A99 suffix is an NHIF billing variant.

Virus	Pathway or procedure code	Admissions	Share of admissions, %	Contracted facilities
Hepatitis B	A38	14,449	44.8	19
	P076.1	11,667	36.2	72
	P076.1A99	4,330	13.4	36
	P073.1	1,035	3.2	31
	P101	329	1.0	36
	P073.1A99	284	0.9	11
Hepatitis C	P076.1	2,411	44.4	59
	A38	1,777	32.8	19
	P076.1A99	935	17.2	26
	P073.1	154	2.8	15

Virus	Pathway or procedure code	Admissions	Share of admissions, %	Contracted facilities
	P101	99	1.8	29
	P073.1A99	27	0.5	5

Table S8. Nominal and constant-2025-price antiviral reimbursement, deflated by the Bulgarian all-items harmonised index of consumer prices. The all-items index was used in preference to the health sub-index, which contains an 11% level shift between March and April 2025 that would propagate into any series spanning it.

Year	Virus	Nominal, EUR	HICP index (2015 = 100)	Constant 2025 prices, EUR
2020 †	Hepatitis B	1,176,173	106.3	1,577,158
2021		2,037,503	109.3	2,656,397
2022		2,022,898	123.5	2,333,735
2023		1,752,227	134.2	1,861,293
2024		1,941,433	137.6	2,010,130
2025		2,205,974	142.5	2,205,974
2026 †		1,298,379	147.7	1,252,837
2020 †	Hepatitis C	8,833,125	106.3	11,844,550
2021		16,871,845	109.3	21,996,687
2022		15,572,863	123.5	17,965,779
2023		19,902,588	134.2	21,141,400
2024		19,714,761	137.6	20,412,363

Year	Virus	Nominal, EUR	HICP index (2015 = 100)	Constant 2025 prices, EUR
2025		19,514,347	142.5	19,514,347
2026 †		8,927,858	147.7	8,614,706

Table S9. Adjunctive products under HBV/HCV diagnoses in the full pharmacy window, July 2020–June 2026. Their observed total is EUR 113,942, approximately 0.09% of all reimbursement in the HBV/HCV pharmacy case definition. These amounts enter the broader pharmaceutical budget-share numerator, while antiviral-only totals exclude them.

Virus diagnosis	Active substance	Packages	Reimbursement, EUR
HBV	ademetionine	9,213	35,554
HBV	silymarin	22,132	32,780
HCV	silymarin	14,748	20,734
HCV	ademetionine	4,574	17,225
HBV	l-ornitine-l-aspartate	404	4,334
HCV	l-ornitine-l-aspartate	316	3,315

Table S10. Antiviral reimbursement by regional health insurance office, 2021 to 2025, in absolute terms and per 100,000 person-years. Activity is attributed to the office that processed the claim rather than to the patient's residence, which is why Sofia city and Sofia district should be read together.

Region	Virus	Reimbursement 2021-2025, EUR	Per 100,000 person-years, EUR
Blagoevgrad	Hep	776,261	54,003
Burgas		688,950	35,836

Region	Virus	Reimbursement 2021-2025, EUR	Per 100,000 person-years, EUR
Dobrich		273,396	37,354
Gabrovo		95,830	20,185
Haskovo		343,978	33,139
Kardzhali		278,750	38,113
Kyustendil		100,045	18,611
Lovech		139,478	24,863
Montana		110,566	19,312
Pazardzhik		398,291	35,443
Pernik		75,339	13,579
Pleven		301,584	27,669
Plovdiv		1,130,387	35,650
Razgrad		161,496	32,211
Ruse		265,813	28,275
Shumen		177,473	23,738
Silistra		164,141	34,695
Sliven		409,709	48,218
Smolyan		110,919	24,115
Sofia Grad		1,775,286	27,560
Sofia Oblast		185,837	16,419
Stara Zagora		523,323	36,038
Targovishte		92,779	19,442
Varna		639,069	29,392
Veliko Tarnovo		300,163	29,664

Region	Virus	Reimbursement 2021-2025, EUR	Per 100,000 person-years, EUR
Vidin		94,712	26,399
Vratsa		186,575	25,280
Yambol		159,888	30,034
Blagoevgrad	Hepatitis C	3,540,902	246,335
Burgas		4,356,150	226,590
Dobrich		1,597,356	218,245
Gabrovo		803,692	169,282
Haskovo		1,370,119	131,999
Kardzhali		939,352	128,437
Kyustendil		1,174,402	218,473
Lovech		1,237,923	220,665
Montana		1,656,876	289,402
Pazardzhik		3,213,297	285,940
Pernik		1,550,143	279,397
Pleven		3,090,425	283,537
Plovdiv		10,113,604	318,962
Razgrad		1,308,996	261,082
Ruse		3,400,686	361,732
Shumen		1,402,396	187,581
Silistra		1,542,764	326,102
Sliven		2,557,675	301,011
Smolyan		825,297	179,427
Sofia Grad		27,122,345	421,051

Region	Virus	Reimbursement 2021-2025, EUR	Per 100,000 person-years, EUR
Sofia Oblast		1,051,334	92,887
Stara Zagora		3,102,814	213,673
Targovishte		513,932	107,698
Varna		6,868,754	315,907
Veliko Tarnovo		2,411,381	238,308
Vidin		979,908	273,129
Vratsa		2,365,835	320,562
Yambol		1,478,047	277,644

Table S11. Interrupted time series at January 2026, when Bulgaria adopted the euro and, the following month, the NHIF revised its treatment requirements. Quasi-Poisson segmented regression with harmonic seasonal terms and Newey–West standard errors at lag 3, on 66 pre-intervention and 6 post-intervention months. With only six post-intervention months and two coincident events, these estimates are provisional.

Virus	**Parameter**	**Ratio (95% CI)**	**p**
Hepatitis B	Pre-intervention monthly trend	1.000 (0.997 to 1.002)	0.694
	Level change at January 2026	1.262 (1.086 to 1.467)	0.003
	Change in monthly trend	1.014 (0.989 to 1.040)	0.256
Hepatitis C	Pre-intervention monthly trend	1.003 (1.001 to 1.005)	0.003
	Level change at January 2026	0.777 (0.678 to 0.891)	<0.001
	Change in monthly trend	1.016 (0.985 to 1.047)	0.308

Table S12. Hepatitis hospital activity valued at the 2025 National Framework Contract tariff schedule. One dated schedule is applied to every year deliberately: tariffs are revised annually and amended within years, and only the 2025 schedule could be sourced completely, so this series moves with volume alone and is not a reconstruction of what the Fund paid in each year. It is never added to pharmacy expenditure.

Year	Virus	Episode type	Episodes	Episodes priced, %	Valued at 2025 tariffs, EUR
2024	Hepatitis B	Inpatient episode	6,504	99.6	4,594,601
2024	Hepatitis B	Treatment-protocol procedure	5,044	100.0	154,750
2024	Hepatitis C	Inpatient episode	1,496	99.5	1,047,934
2024	Hepatitis C	Treatment-protocol procedure	708	100.0	21,721
2025	Hepatitis B	Inpatient episode	7,020	99.7	4,884,691
2025	Hepatitis B	Treatment-protocol procedure	5,646	100.0	173,219
2025	Hepatitis C	Inpatient episode	1,401	99.9	958,707
2025	Hepatitis C	Treatment-protocol procedure	684	100.0	20,985
2026	Hepatitis B	Inpatient episode	4,296	99.2	2,864,793
2026	Hepatitis B	Treatment-protocol procedure	3,759	100.0	115,326
2026	Hepatitis C	Inpatient episode	751	99.9	488,909
2026	Hepatitis C	Treatment-protocol procedure	385	100.0	11,812

Table S13. The 2025 tariffs applied, by pathway and procedure code. Codes carrying the A99 suffix are cases reported as ambulatory procedure 99, the early completion of a clinical pathway: Article 354(1) of the National Framework Contract allows a pathway with a contracted minimum stay of up to three days to be closed this way once all mandatory activities have been performed after at least twelve hours and a physician has recorded that early discharge carries no medical risk. Such a case is paid at 80% of the pathway price, and is valued here at that rate; the exceptions in the contract — 60% for pathways 240 to 243 and 245, and the full price for pathways 16, 17.1, 17.2, 19.1, 20.1, 20.2, 25, 27 and 33 — cover no hepatitis pathway [40]. Ambulatory procedure 38 is priced at EUR 30.68 from the same schedule. Codes accounting for 0.2% of episodes could not be priced at all.

Virus	Code	Pathway or procedure	2025 tariff, EUR	Episodes	Valued, EUR
HBV	A38	Determination of treatment plan and monitoring of therapeutic response in patients receiving high-cost medicinal products under Article 78(2) of the Health Insurance Act	31	14,449	443,295
HBV	P076.1	Diagnosis and treatment of chronic liver disease in persons aged 18 and over	668	11,667	7,795,423
HBV	P076.1A99	Diagnosis and treatment of chronic liver disease in persons aged 18 and over, early completion (APr 99)	535	4,330	2,314,515
HCV	P076.1	Diagnosis and treatment of chronic liver disease in persons aged 18 and over	668	2,411	1,610,934
HCV	A38	Determination of treatment plan and monitoring of therapeutic response in patients receiving high-cost medicinal products under Article 78(2) of the Health Insurance Act	31	1,777	54,518
HBV	P073.1	Highly specialised interventional procedures for hepatobiliary, pancreatic and peritoneal disease, 18 and over	1,338	1,035	1,384,892
HCV	P076.1A99	Diagnosis and treatment of chronic liver disease in persons aged 18 and over, early completion (APr 99)	535	935	499,786
HBV	P101	Diagnosis and treatment of acute viral hepatitis B, C and D	1,416	329	465,917
HBV	P073.1A99	Highly specialised interventional procedures for hepatobiliary, pancreatic and peritoneal disease, 18 and over, early completion (APr 99)	1,070	284	304,008
HCV	P073.1	Highly specialised interventional procedures for hepatobiliary, pancreatic and peritoneal disease, 18 and over	1,338	154	206,061
HCV	P101	Diagnosis and treatment of acute viral hepatitis B, C and D	1,416	99	140,200
HBV	P076.2	Diagnosis and treatment of chronic liver disease in persons under 18	907	66	59,867
HCV	P073.1A99	Highly specialised interventional procedures for hepatobiliary, pancreatic and peritoneal disease, 18 and over, early completion (APr 99)	1,070	27	28,902
HBV	P076.2A99	Diagnosis and treatment of chronic liver disease in persons under 18, early completion (APr 99)	726	26	18,867
HCV	P076.2	Diagnosis and treatment of chronic liver disease in persons under 18	907	6	5,442

Virus	Code	Pathway or procedure	2025 tariff, EUR	Episodes	Valued, EUR
HCV	P076.2A99	Diagnosis and treatment of chronic liver disease in persons under 18, early completion (APr 99)	726	5	3,628
HBV	P090.1	Diagnosis and treatment of inflammatory joint disease in persons aged 18 and over	596	1	596
HCV	P090.1	Diagnosis and treatment of inflammatory joint disease in persons aged 18 and over	596	1	596

Table S14. Treatment-protocol procedures in the full January 2024–July 2026 source window. These are repeated administrative encounters within the same reimbursement system, not unique patients or an independent validation of dispensing-based estimates. The 31-month totals annualise to 5,593 HBV and 688 HCV procedures. In complete years 2024–2025 the corresponding observed annual means were 5,345 and 696.

Virus	Procedures observed	Months	Designated facilities	Procedures per year
Hepatitis B	14,449	31	19	5,593
Hepatitis C	1,777	31	19	688

Table S15. National Health Insurance Fund data sources analysed, their coverage and the number of records meeting the hepatitis case definition.

Data source	Coverage	Months	Aggregation unit	Records in scope
Outpatient pharmacy reimbursement	Jul 2020 to Jun 2026	72	product x region x diagnosis x ten-day sub-period	29,151
Hospitalisations	Jan 2024 to Jul 2026	31	facility x pathway x diagnosis pair x month	22,151
Outpatient consultations	Jan 2024 to Jul 2026	31	practice x specialty x diagnosis x month	45,304

Table S16. Full-window annual antiviral reimbursement and dispensing-based treatment estimates, July 2020–June 2026. † Partial years: July–December 2020 and January–June 2026. The budget-share numerator is all reimbursement in the HBV/HCV pharmacy case definition, comprising antivirals in both identification arms plus adjunctive products; the denominator is all NHIF outpatient pharmaceutical reimbursement in the same observed months. This is not an antiviral-only share. Complete-year primary results are in manuscript Table 1.

Year	Hepatitis B, EUR	HBV mean continuous therapy equivalents	Hepatitis C, EUR	Hepatitis C, standard-course equivalents (range)	All hepatitis products share of NHIF outpatient drug budget, %
2020 †	1,176,173	2,224	8,833,125	308 (211 to 310)	4.34
2021	2,037,503	2,226	16,871,845	604 (431 to 607)	3.99
2022	2,022,898	2,277	15,572,863	575 (404 to 575)	3.33
2023	1,752,227	2,441	19,902,588	743 (530 to 743)	3.48
2024	1,941,433	2,675	19,714,761	777 (526 to 777)	3.06
2025	2,205,974	3,051	19,514,347	777 (571 to 777)	2.61
2026 †	1,298,379	3,182	8,927,858	359 (249 to 359)	2.26

Table S17. Log-linear monthly monetary-expenditure sensitivity models, with annual sine/cosine terms and Bartlett Newey–West covariance at lag 3. Primary windows contain 60 months (2021–2025); full windows contain 72 months (July 2020–June 2026). All rows use normal Wald confidence intervals and p-values for a consistent comparison.

Virus	Months	Monthly ratio (95% CI)	Annualised change, %	p
HBV 2021–2025	60	1.0010 (0.9992 to 1.0029)	+1.2	0.285
HBV full window	72	1.0012 (0.9987 to 1.0037)	+1.5	0.332
HCV 2021–2025	60	1.0046 (1.0027 to 1.0065)	+5.7	<0.001
HCV full window	72	1.0019 (1.0002 to 1.0037)	+2.4	0.031

Supplementary figures

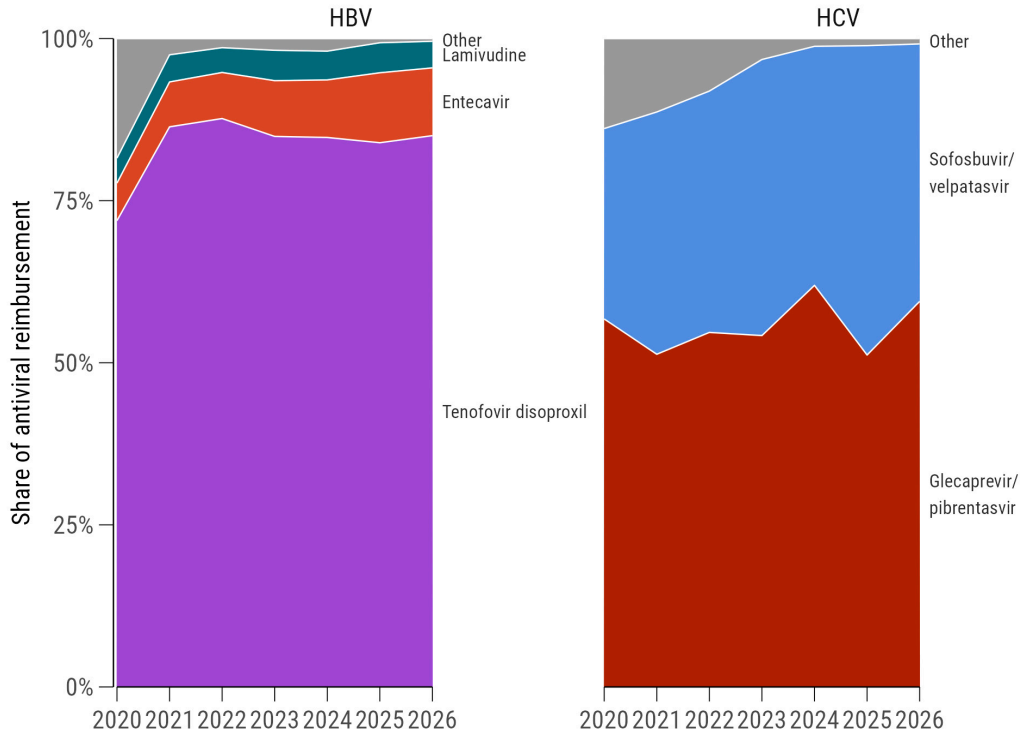


Figure S1. Annual composition of antiviral reimbursement by leading product. Products outside the displayed categories are combined as Other.

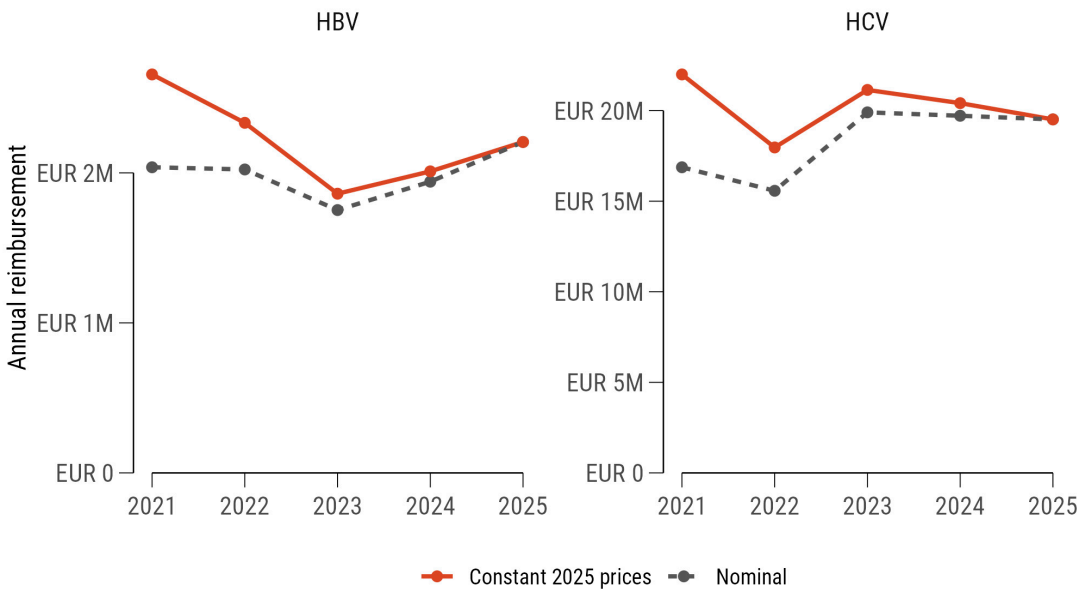


Figure S2. Nominal and constant-2025-price antiviral reimbursement, 2021 to 2025.

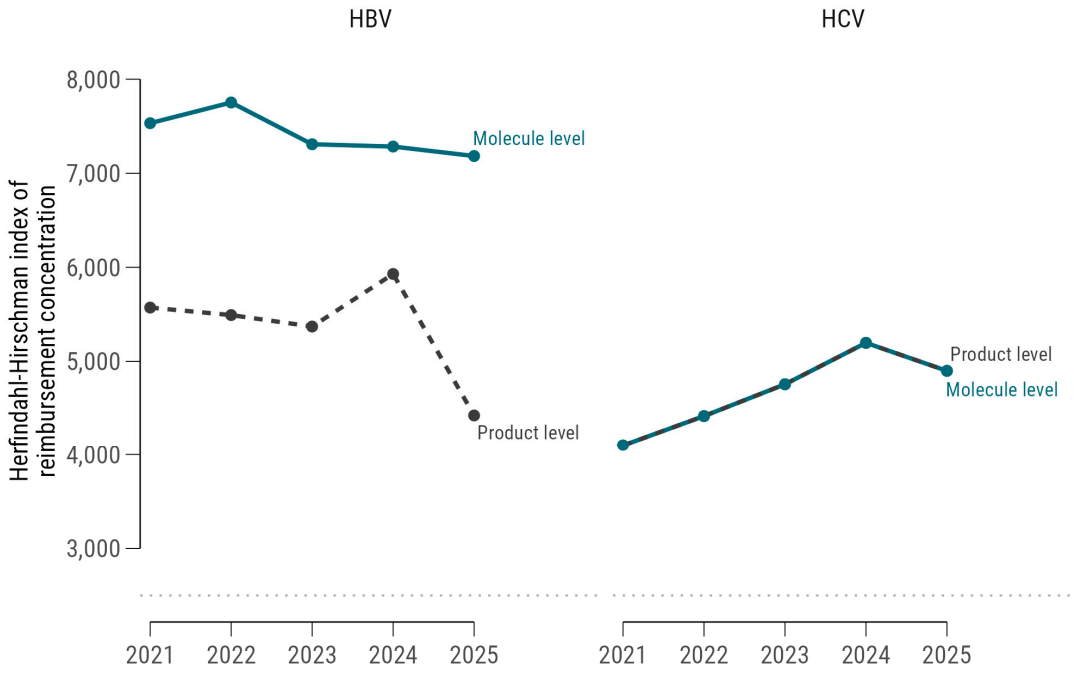


Figure S3. Herfindahl-Hirschman index of reimbursement concentration by virus and year, at product and molecule level. The shaded band begins at 2,500.

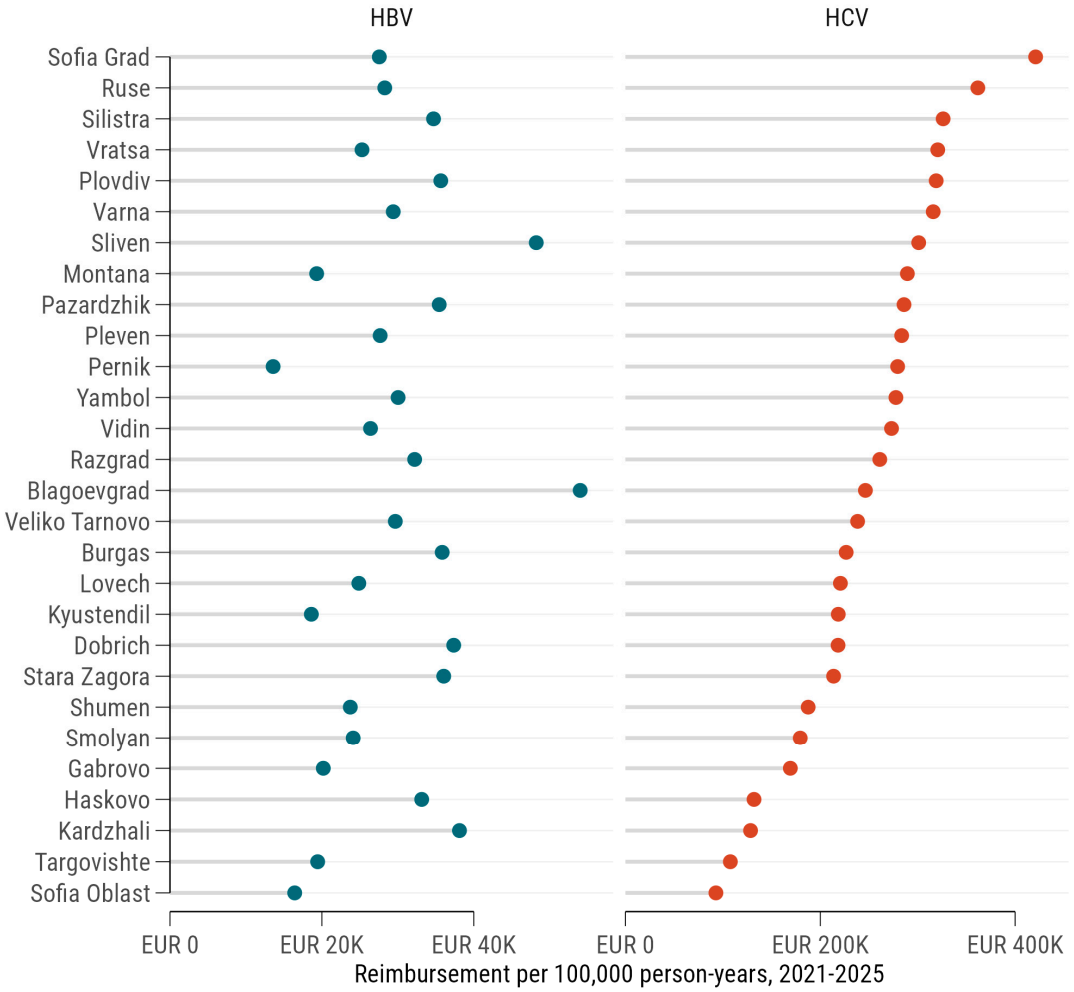


Figure S4. Antiviral reimbursement per 100,000 person-years by processing regional health insurance office, 2021 to 2025. The office is not necessarily the patient's place of residence.

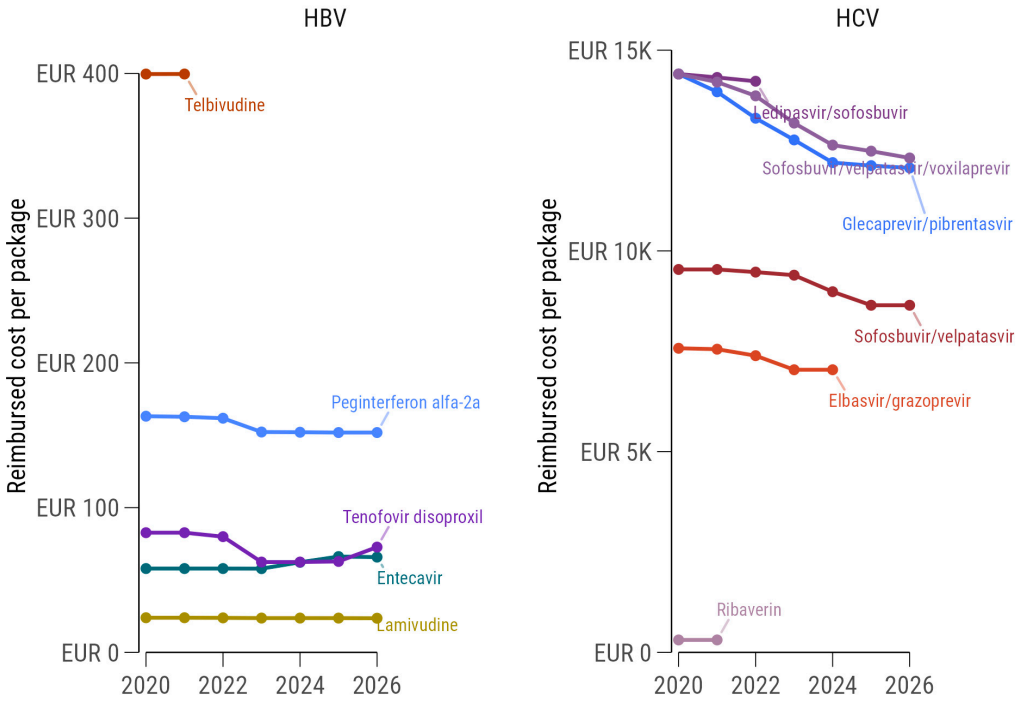


Figure S5. Annual reimbursed cost per package for the leading antiviral molecules. Values for 2020 and 2026 cover partial years.

Tables S18 and S19. Reporting checklists

The study is reported in accordance with the STROBE statement for observational studies [31], extended by RECORD for studies using routinely collected health data [32]. Items are located by subheading rather than by page number, since page numbers change between the submitted and typeset versions.

STROBE checklist

Table S18. STROBE checklist.

Item	Checklist item	Reported in
1	(a) Indicate the study's design with a commonly used term in the title or the abstract. (b) Provide in the abstract an informative and balanced summary of what was done and what was found	Title; Abstract → Background, Methods, Results, Conclusions
2	Explain the scientific background and rationale for the investigation being reported	Introduction
3	State specific objectives, including any prespecified hypotheses	Introduction, final paragraph. No hypotheses were prespecified; the study is descriptive
4	Present key elements of study design early in the paper	Abstract → Methods; Materials and Methods → Study design and reporting
5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	Materials and Methods → Data sources; Table S15
6	(a) Cross-sectional study — Give the eligibility criteria, and the sources and methods of selection of participants	Materials and Methods → Case definition; Supplementary methods → Case definition in full. (b) N/A — not a matched study
7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	Materials and Methods → Case definition; Expenditure and price adjustment; Treatment volumes. Confounders and effect modifiers N/A — no causal estimand is targeted
8	For each variable of interest, give sources of data and details of methods of assessment	Materials and Methods → Data sources; Expenditure and price adjustment; Treatment volumes
9	Describe any efforts to address potential sources of bias	Supplementary methods → Data quality and corrections; Discussion → Strengths and limitations
10	Explain how the study size was arrived at	Materials and Methods → Data sources. The study is a total enumeration of national reimbursement records; no sampling and no size calculation

Item	Checklist item	Reported in
11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	Materials and Methods → Expenditure and price adjustment; Treatment volumes; Statistical analysis
12	(a) Describe all statistical methods, including those used to control for confounding. (b) subgroups and interactions. (c) missing data. (d) sampling strategy. (e) sensitivity analyses	(a), (b), (e) Materials and Methods → Price–volume decomposition; Statistical analysis. (c) Not reported as a separate item — the aggregated source contains no missing reimbursement or count fields within the hepatitis subset; the one missing package size is described in Supplementary methods. (d) N/A — total enumeration, no sampling
13	(a) Report numbers of individuals at each stage. (b) Give reasons for non-participation. (c) Consider use of a flow diagram	Table S15 gives records at each source. (a)–(c) partly N/A — the data are aggregated counts, not individuals, so no individual-level flow exists and no flow diagram is possible
14	(a) Give characteristics of study participants and information on exposures and potential confounders. (b) missing data per variable. (c) follow-up time	N/A — aggregated data with no participant characteristics. Distribution across the case definition is in Supplementary Table S1
15	Report numbers of outcome events or summary measures over time	Results → Records and reimbursed expenditure; Price, quantity, and treatment volume; Hospital and outpatient activity
16	(a) Give unadjusted and, if applicable, confounder-adjusted estimates and their precision. (b) category boundaries. (c) absolute risk	(a) Results → Price, quantity, and treatment volume; Hospital and outpatient activity; Table 5 and Table S20, with 95% confidence intervals for model estimates. No adjustment for confounding is made and none is claimed. (b) N/A. (c) N/A
17	Report other analyses done, including sensitivity analyses	Supplementary Tables S3, S4, S8, S10, S11, and S17
18	Summarise key results with reference to study objectives	Discussion → Principal findings
19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	Discussion → Strengths and limitations

Item	Checklist item	Reported in
20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	Discussion → Principal findings; Comparison with other evidence; Implications; Conclusions
21	Discuss the generalisability (external validity) of the study results	Discussion → Comparison with other evidence; Strengths and limitations
22	Give the source of funding and the role of the funders	Funding

RECORD checklist

Table S19. RECORD checklist.

Item	Checklist item	Reported in
1.1	The type of data used should be specified in the title or abstract. When possible, the name of the databases used should be included	Title ("Health Insurance Expenditure and Health-System Use"); Abstract → Methods, which names the three National Health Insurance Fund datasets
1.2	If applicable, the geographical region and timeframe within which the study took place should be reported in the title or abstract	Title ("Bulgaria, 2021–2025"); Abstract → Methods
1.3	If linkage between databases was conducted for the study, this should be clearly stated in the title or abstract	N/A — no linkage. The three datasets are analysed in parallel and are never joined to one another; the only joins are to aggregate population and price-index denominators
6.1	The methods of study population selection (such as codes or algorithms used to identify participants) should be listed in detail. If this is not possible, an explanation should be provided	Materials and Methods → Case definition; Supplementary methods → Case definition in full gives every ICD-10 code and its group
6.2	Any validation studies of the codes or algorithms used to select the population should be referenced. If validation was conducted for this study and not published elsewhere, detailed methods and results should be provided	Not reported — no validation study of NHIF hepatitis diagnosis coding against clinical records exists to our knowledge, and none was conducted here. Stated as a limitation in Discussion → Strengths and limitations

Item	Checklist item	Reported in
6.3	If the study involved linkage of databases, consider use of a flow diagram or other graphical display to demonstrate the data linkage process	N/A — no linkage, as at item 1.3
7.1	A complete list of codes and algorithms used to classify exposures, outcomes, confounders, and effect modifiers should be provided. If these cannot be reported, an explanation should be provided	Materials and Methods → Case definition; Expenditure and price adjustment (ATC classification rules); Supplementary methods → Case definition in full; Treatment course definitions
12.1	Authors should describe the extent to which the investigators had access to the database population used to create the study population	Materials and Methods → Data sources; Data Availability Statement. All three datasets are openly published in full; the investigators had complete access to every released record
12.2	Authors should provide information on the data cleaning methods used in the study	Supplementary methods → Data quality and corrections
12.3	State whether the study included person level, institutional level, or other data linkage across two or more databases	Materials and Methods → Data sources. No linkage; the data are aggregated counts, not person-level records
13.1	Describe in detail the selection of the individuals included in the study including filtering based on data quality, data availability, and linkage	Materials and Methods → Case definition; Supplementary methods → Data quality and corrections; Table S15. Selection is at record rather than individual level, since the source is aggregated
19.1	Discuss the implications of using data that were not created or collected to answer the specific research question(s). Include discussion of misclassification bias, unmeasured confounding, missing data, and changing eligibility over time	Discussion → Strengths and limitations, which covers reimbursement-driven coding, the absence of individual-level follow-up, costs falling outside the NHIF, and the coincidence of the euro changeover with the February 2026 revision of treatment eligibility
22.1	Authors should provide information on how to access any supplemental information such as the study protocol, raw data, or programming code	Data Availability Statement, which gives the DOI of each source dataset and states how the analysis code may be obtained

Additional sensitivity analyses

Table S20A. Complete-year and full-window seasonal quasi-Poisson models. Reimbursement windows contain 60 and 72 months, respectively; service windows contain 24 and 31. Bartlett covariance lag 3 and normal Wald inference are used throughout.

Series	Window	Months	Monthly ratio and 95% CI	Annualised change %	p
Antiviral reimbursement HBV	Complete years	60	1.0011 (0.9993–1.0030)	+1.4	0.219
Antiviral reimbursement HBV	Full source window	72	1.0014 (0.9988–1.0040)	+1.7	0.283
Antiviral reimbursement HCV	Complete years	60	1.0044 (1.0025–1.0063)	+5.4	<0.001
Antiviral reimbursement HCV	Full source window	72	1.0018 (1.0001–1.0035)	+2.2	0.042
Inpatient episodes HBV	Complete years	24	1.0074 (1.0030–1.0118)	+9.2	<0.001
Inpatient episodes HBV	Full source window	31	1.0060 (1.0034–1.0087)	+7.5	<0.001
Inpatient episodes HCV	Complete years	24	0.9936 (0.9898–0.9974)	-7.4	<0.001
Inpatient episodes HCV	Full source window	31	0.9935 (0.9913–0.9958)	-7.5	<0.001
Protocol procedures HBV	Complete years	24	1.0100 (1.0053–1.0147)	+12.7	<0.001
Protocol procedures HBV	Full source window	31	1.0113 (1.0082–1.0143)	+14.4	<0.001
Protocol procedures HCV	Complete years	24	0.9958 (0.9889–1.0026)	-5.0	0.225
Protocol procedures HCV	Full source window	31	0.9979 (0.9928–1.0030)	-2.5	0.426
Consultations HBV	Complete years	24	1.0030 (1.0012–1.0048)	+3.7	<0.001
Consultations HBV	Full source window	31	1.0029 (1.0018–1.0040)	+3.5	<0.001
Consultations HCV	Complete years	24	0.9941 (0.9904–0.9978)	-6.9	0.002
Consultations HCV	Full source window	31	0.9948 (0.9926–0.9971)	-6.1	<0.001

Table S20B. Complete-year sensitivity to seasonal specification and covariance lag. Removing seasonal terms changes the point estimate; changing only the covariance lag changes uncertainty without changing the estimated trend. Lag 0 is the heteroskedasticity-robust limit of the Bartlett estimator.

Series	Specification	HAC lag	Monthly ratio and 95% CI	Annualised change %	p
Antiviral reimbursement HBV	Annual sine/cosine	0	1.0011 (0.9999–1.0024)	+1.4	0.068
Antiviral reimbursement HBV	Annual sine/cosine	1	1.0011 (0.9997–1.0026)	+1.4	0.124
Antiviral reimbursement HBV	Annual sine/cosine	6	1.0011 (0.9990–1.0033)	+1.4	0.301
Antiviral reimbursement HBV	No seasonal terms	3	1.0012 (0.9993–1.0031)	+1.4	0.216
Antiviral reimbursement HCV	Annual sine/cosine	0	1.0044 (1.0026–1.0061)	+5.4	<0.001
Antiviral reimbursement HCV	Annual sine/cosine	1	1.0044 (1.0024–1.0063)	+5.4	<0.001
Antiviral reimbursement HCV	Annual sine/cosine	6	1.0044 (1.0024–1.0063)	+5.4	<0.001
Antiviral reimbursement HCV	No seasonal terms	3	1.0036 (1.0010–1.0063)	+4.4	0.007
Inpatient episodes HBV	Annual sine/cosine	0	1.0074 (1.0020–1.0128)	+9.2	0.007
Inpatient episodes HBV	Annual sine/cosine	1	1.0074 (1.0019–1.0128)	+9.2	0.008
Inpatient episodes HBV	Annual sine/cosine	6	1.0074 (1.0038–1.0110)	+9.2	<0.001
Inpatient episodes HBV	No seasonal terms	3	1.0068 (1.0021–1.0115)	+8.4	0.005
Inpatient episodes HCV	Annual sine/cosine	0	0.9936 (0.9874–0.9999)	-7.4	0.046
Inpatient episodes HCV	Annual sine/cosine	1	0.9936 (0.9876–0.9996)	-7.4	0.036
Inpatient episodes HCV	Annual sine/cosine	6	0.9936 (0.9896–0.9977)	-7.4	0.002
Inpatient episodes HCV	No seasonal terms	3	0.9950 (0.9911–0.9989)	-5.9	0.012
Protocol procedures HBV	Annual sine/cosine	0	1.0100 (1.0022–1.0178)	+12.7	0.011

Series	Specification	HAC lag	Monthly ratio and 95% CI	Annualised change %	p
Protocol procedures HBV	Annual sine/cosine	1	1.0100 (1.0027–1.0173)	+12.7	0.007
Protocol procedures HBV	Annual sine/cosine	6	1.0100 (1.0065–1.0136)	+12.7	<0.001
Protocol procedures HBV	No seasonal terms	3	1.0100 (1.0048–1.0152)	+12.7	<0.001
Protocol procedures HCV	Annual sine/cosine	0	0.9958 (0.9862–1.0054)	-5.0	0.388
Protocol procedures HCV	Annual sine/cosine	1	0.9958 (0.9871–1.0045)	-5.0	0.343
Protocol procedures HCV	Annual sine/cosine	6	0.9958 (0.9907–1.0008)	-5.0	0.101
Protocol procedures HCV	No seasonal terms	3	0.9980 (0.9899–1.0062)	-2.4	0.627
Consultations HBV	Annual sine/cosine	0	1.0030 (1.0002–1.0058)	+3.7	0.036
Consultations HBV	Annual sine/cosine	1	1.0030 (1.0003–1.0057)	+3.7	0.030
Consultations HBV	Annual sine/cosine	6	1.0030 (1.0015–1.0045)	+3.7	<0.001
Consultations HBV	No seasonal terms	3	1.0029 (1.0011–1.0046)	+3.5	0.001
Consultations HCV	Annual sine/cosine	0	0.9941 (0.9897–0.9985)	-6.9	0.009
Consultations HCV	Annual sine/cosine	1	0.9941 (0.9897–0.9985)	-6.9	0.009
Consultations HCV	Annual sine/cosine	6	0.9941 (0.9908–0.9974)	-6.9	<0.001
Consultations HCV	No seasonal terms	3	0.9947 (0.9907–0.9988)	-6.1	0.012

Model interpretation. With 24 complete service months, only two annual cycles are observed. The models estimate descriptive smooth trends; neither harmonic adjustment nor HAC inference removes uncertainty from the short series or endpoint choice. The complete-year and full-window service trends have the same directions. The HCV protocol trend is compatible with no change, and the magnitude of the expenditure trend, especially for HCV, differs between windows. No causal effect or access outcome is inferred.

Table S21. Observed antiviral identification codes. Canonical ATC codes use each product's most recent observed ATC; historical codes are listed where observed. NHIF codes identify reimbursed products. Drug-identified records additionally require K74.0 or K74.6; a product code alone does not establish infection. This inventory covers the full source window.

Virus assignment	Canonical ATC	Observed ATC codes	Active substance	Observed NHIF product codes
HBV	J05AF05	J05AF05	lamivudine	JF417
HBV	J05AF07	J05AF07	tenofovir disoproxil	JF464, JF572, JF576, JF579, JF582, JF590, JF593
HBV	J05AF10	J05AF10	entecavir	JF462, JF578, JF580, JF581
HBV	J05AF11	J05AF11	telbivudine	JF453
HBV	L03AB11	L03AB11	peginterferon alfa 2-a	LF079
HCV	J05AB04	J05AB04	ribaverin	JF337, JF512
HCV	J05AP51	J05AP51, J05AX65	ledipasvir/sofosbuvir	JF569
HCV	J05AP54	J05AP54, J05AX68	elbasvir/grazoprevir	JF571
HCV	J05AP55	J05AP55, J05AX69	sofosbuvir/velpatasvir	JF575
HCV	J05AP56	J05AP56	sofosbuvir, veloatasvir, voxilaprevir	JF585
HCV	J05AP57	J05AP57	glecaprevir, pibrentasvir	JF583

The HBV diagnosis list is B16, B16.0, B16.1, B16.2, B16.9, B17.0, B18.0, B18.1; the HCV list is B17.1, B18.2. Non-specific codes are B18, B18.8, B18.9, B19, B19.0, B19.9, Z22.5 and are not assigned to HBV or HCV. Peginterferon and ribavirin do not have exclusive indications; their assignments depend on the stated administrative algorithm and context.

Table S22. Case-definition sensitivity during complete years 2021–2025. The main definition combines mutually exclusive diagnosis- and drug-identified records. The diagnosis-only definition excludes all K74.0/K74.6 records; the third definition removes only peginterferon alfa-2a from the drug-identified arm. The table assesses the expenditure consequence of the rules, not diagnostic validity.

Definition	HBV EUR	HCV EUR	Total EUR	Change from main total %
Both arms	9,960,035.57	91,576,404.93	101,536,440.50	+0.000
Diagnosis-identified only	8,390,788.21	72,254,752.72	80,645,540.93	-20.575
Both arms excluding drug-identified peginterferon	9,938,816.76	91,576,404.93	101,515,221.69	-0.021

Excluding the entire drug-identified arm reduces observed antiviral reimbursement by 20.575%. Excluding only drug-identified peginterferon reduces the total by 0.021% and HBV reimbursement by 0.213%. Small aggregate impact does not validate the allocation of individual records or the specificity of other medicines.

Table S23. Product-level Fisher decomposition for all complete-year comparisons. Fixed-base rows compare each year with 2021; chained rows compare consecutive years. Factors multiply to the expenditure ratio before rounding. These are the intermediate and chained comparisons not shown in manuscript Table 3.

Basis	Virus	Comparison	Expenditure ratio	Price index	Quantity index	Entry and exit	Matched products
Fixed base	HBV	2021 to 2022	0.993	0.971	1.034	0.989	9
Fixed base	HBV	2021 to 2023	0.860	0.784	1.128	0.972	8
Fixed base	HBV	2021 to 2024	0.953	0.789	1.243	0.971	8
Fixed base	HBV	2021 to 2025	1.083	0.799	1.395	0.971	7
Fixed base	HCV	2021 to 2022	0.923	0.970	0.952	0.999	5
Fixed base	HCV	2021 to 2023	1.180	0.943	1.267	0.987	4
Fixed base	HCV	2021 to 2024	1.169	0.901	1.313	0.987	4

Basis	Virus	Comparison	Expenditure ratio	Price index	Quantity index	Entry and exit	Matched products
Fixed base	HCV	2021 to 2025	1.157	0.885	1.447	0.903	3
Chained	HBV	2021 to 2022	0.993	0.971	1.034	0.989	9
Chained	HBV	2022 to 2023	0.866	0.806	1.079	0.996	8
Chained	HBV	2023 to 2024	1.108	1.006	1.101	1.000	8
Chained	HBV	2024 to 2025	1.136	1.012	1.123	1.000	7
Chained	HCV	2021 to 2022	0.923	0.970	0.952	0.999	5
Chained	HCV	2022 to 2023	1.278	0.972	1.318	0.998	4
Chained	HCV	2023 to 2024	0.991	0.956	1.036	1.000	4
Chained	HCV	2024 to 2025	0.990	0.980	1.011	0.999	3

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