Short communication

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Trends in hepatocellular carcinoma stage by racial/ethnic group in the United States, 1992–2019

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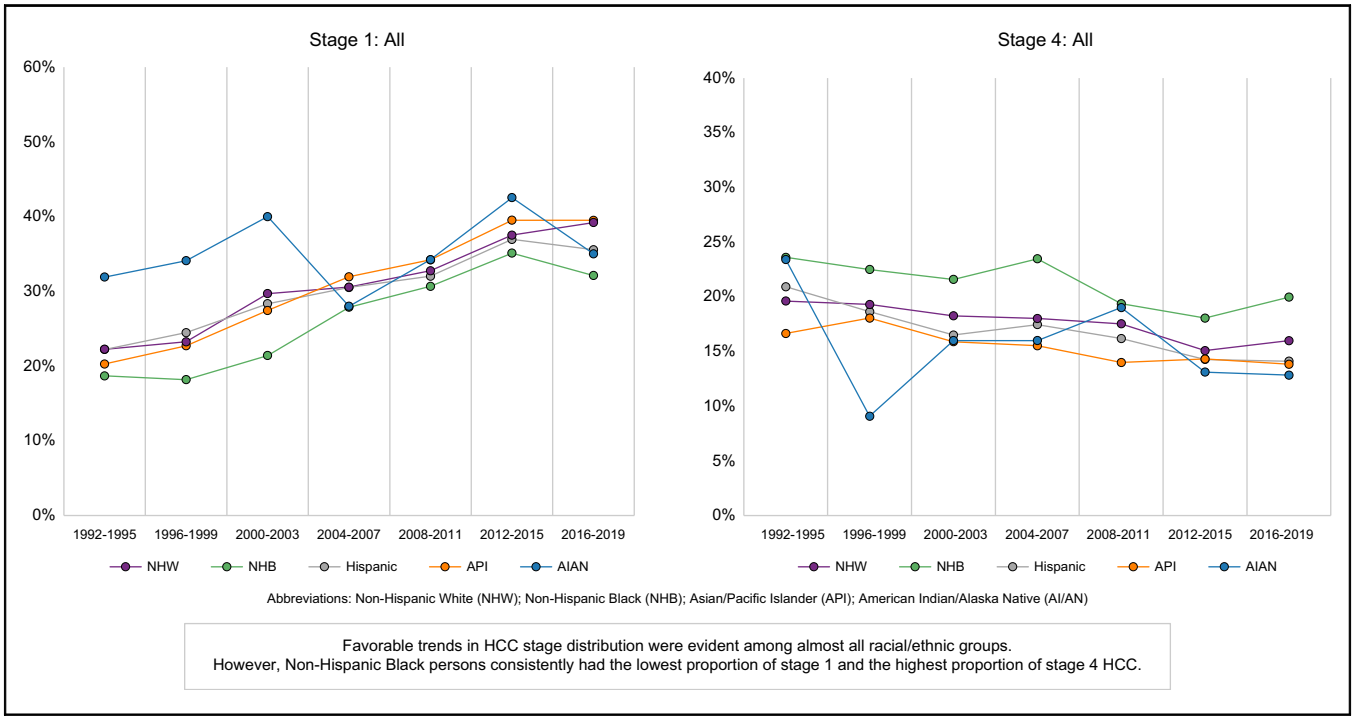
Graphical abstract



Highlights

- From 1992–2019, the proportion of stage 1 HCCs increased and the proportion of stage 4 HCCs decreased among all racial/ethnic groups except American Indians/Alaska Natives.
- Among American Indians/Alaska Natives, the proportion of stage 1 HCCs remained stable, and the proportion of stage 4 HCCs declined.
- Non-Hispanic Black persons had the lowest proportion of stage 1 HCCs and the highest proportion of stage 4 HCCs of any racial/ethnic group.
- Incidence rates of HCC have continued to decline for all racial/ethnic groups except American Indians/Alaska Natives.

Impact and implications

HCC incidence rates among most United States racial/ethnic groups began to decline in recent years, but whether stage at diagnosis also improved was unclear. As a result, a new SEER stage variable was used to examine stage trends by race/ethnicity. Although the finding of generally favourable trends in stage as well as incidence is encouraging, continuity disparities in both stage and incidence require serious attention.

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Trends in hepatocellular carcinoma stage by racial/ethnic group in the United States, 1992–2019

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Background & Aims: Although incidence rates of hepatocellular carcinoma (HCC) began to decline in the United States in the past decade, disparities in rates among racial/ethnic groups have persisted. Whether disparities in stage at diagnosis have remained over time, however, is unclear.
Methods: National Cancer Institute's Surveillance, Epidemiology and End Results (SEER) program has created a new staging-over-time variable that facilitates the examination of trends in HCC stage. Thus, the proportions of HCCs diagnosed by stage between 1992 and 2019 were examined among non-Hispanic White, non-Hispanic Black (NHB), Hispanic, Asian/Pacific Islander, and American Indian/Alaska Native (AI/AN) individuals. HCC incidence between 1992 and 2019 was also analysed using Joinpoint regression.
Results: Between 1992 and 2019, the proportion of stage 1 HCCs increased and the proportion of stage 4 HCCs decreased among non-Hispanic White, NHB, Hispanic, and Asian/Pacific Islander individuals. Among AI/AN persons, the proportion of stage 1 tumours remained stable, and the proportion of stage 4 tumours declined. In the most recent time period, NHB individuals had the lowest proportions of stage 1 HCCs (32%) and the highest proportion of stage 4 HCCs (20%) of any group. Joinpoint analysis found that HCC incidence began to decline by 2013 among all groups except AI/AN individuals, the only group that had an increase in incidence.
Conclusions: Despite generally favourable trends in HCC stage and incidence rates, disparities remain. NHB persons continue to have less favourable stages at diagnosis, and incidence rates continue to increase among AI/AN persons.
Impact and implications: HCC incidence rates among most United States racial/ethnic groups began to decline in recent years, but whether stage at diagnosis also improved was unclear. As a result, a new SEER stage variable was used to examine stage trends by race/ethnicity. Although the finding of generally favourable trends in stage as well as incidence is encouraging, continuity disparities in both stage and incidence require serious attention.

Introduction

Hepatocellular carcinoma (HCC) is characterised by sex and racial/ethnic disparities in the USA.[1] Our previous reports from the Surveillance, Epidemiology and End Results (SEER) cancer registries have shown that HCC rates began to decline among both sexes and most racial/ethnic groups in the past decade.[2,3] However, differences in rates among groups have continued to persist.[2] In addition, differences in HCC stage at diagnosis have been reported by some studies.[4] HCC staging criteria have changed over time, however, thus suggesting that previous temporal analyses might have been misleading. The development of new SEER staging-over-time variables has enabled us to examine HCC stage by race/ethnicity and sex between 1992 and 2019 in the United States population.

Materials and methods

Data on HCC incidence, including the new staging-over-time variable, were retrieved from the SEER-12 database for 1992–2019.[5] To derive the new variable, SEER harmonised T, N, and M definitions with data on histology, tumour size, regional nodes positivity, summary stage, and other items. HCCs were identified using the International Classification of Disease for Oncology, third edition, topography code C22 and morphology codes 8170-8174 (code 8175 was not eligible for TNM staging per the American Joint Committee on Cancer eighth edition[6] guidelines). Single HCC counts were grouped into seven 4-year periods. Proportions of cases diagnosed at stages 1 through 4, and an unknown stage, were calculated by sex and race/ethnicity (non-Hispanic White [NHW], non-Hispanic Black [NHB], Hispanic, Asian/Pacific Islander [API], and American Indian/Alaska Native [AI/AN] [purchased/referred care delivery area only]). 95%

Keywords: Carcinomas; Hepatocellular; Neoplasm staging; Trends; US population; Race/ethnicity.
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Table 1. Stage-specific proportions and 95% CIs of hepatocellular carcinomas overall and by sex and race/ethnicity in the USA, SEER-12 registries with specialised staging over time fields, 1992–2019.

		Stage 1			Stage 2			Stage 3			Stage 4			Stage unknown		
All		**Cases**	**%**	**95% CI**	**Cases**	**%**	**95% CI**	**Cases**	**%**	**95% CI**	**Cases**	**%**	**95% CI**	**Cases**	**%**	**95% CI**
Non-Hispanic White	1992–1995	381	22	(20% 24%)	228	13	(12% 15%)	248	14	(13% 16%)	336	20	(18% 21%)	520	30	(28% 33%)
	1996–1999	506	23	(21% 25%)	385	18	(16% 19%)	328	15	(14% 17%)	420	19	(18% 21%)	537	25	(23% 26%)
	2000–2003	756	30	(28% 31%)	499	20	(18% 21%)	430	17	(15% 18%)	465	18	(17% 20%)	396	16	(14% 17%)
	2004–2007	1,033	31	(29% 32%)	733	22	(20% 23%)	545	16	(15% 17%)	609	18	(17% 19%)	459	14	(12% 15%)
	2008–2011	1,500	33	(31% 34%)	1,015	22	(21% 23%)	835	18	(17% 19%)	803	18	(16% 19%)	427	9	(8% 10%)
	2012–2015	2,052	38	(36% 39%)	1,157	21	(20% 22%)	973	18	(17% 19%)	825	15	(14% 16%)	461	8	(8% 9%)
	2016–2019	2,067	39	(38% 41%)	950	18	(17% 19%)	917	17	(16% 18%)	843	16	(15% 17%)	495	9	(9% 10%)
Non-Hispanic Black	1992–1995	57	19	(14% 23%)	40	13	(9% 17%)	55	18	(14% 22%)	72	24	(19% 28%)	81	27	(22% 32%)
	1996–1999	80	18	(15% 22%)	93	21	(17% 25%)	79	18	(14% 22%)	99	23	(19% 26%)	89	20	(16% 24%)
	2000–2003	124	21	(18% 25%)	119	21	(17% 24%)	119	21	(17% 24%)	125	22	(18% 25%)	92	16	(13% 19%)
	2004–2007	247	28	(25% 31%)	177	20	(17% 23%)	181	20	(18% 23%)	208	23	(21% 26%)	73	8	(6% 10%)
	2008–2011	345	31	(28% 33%)	225	20	(18% 22%)	232	21	(18% 23%)	218	19	(17% 22%)	105	9	(8% 11%)
	2012–2015	488	35	(33% 38%)	263	19	(17% 21%)	272	20	(17% 22%)	251	18	(16% 20%)	116	8	(7% 10%)
	2016–2019	439	32	(30% 35%)	224	16	(14% 18%)	295	22	(19% 24%)	273	20	(18% 22%)	136	10	(8% 12%)
Hispanic	1992–1995	120	22	(19% 26%)	91	17	(14% 20%)	71	13	(10% 16%)	113	21	(17% 24%)	145	27	(23% 31%)
	1996–1999	206	24	(22% 27%)	152	18	(15% 21%)	122	14	(12% 17%)	157	19	(16% 21%)	205	24	(21% 27%)
	2000–2003	333	28	(26% 31%)	256	22	(19% 24%)	185	16	(14% 18%)	194	17	(14% 19%)	207	18	(15% 20%)
	2004–2007	519	31	(28% 33%)	360	21	(19% 23%)	308	18	(16% 20%)	297	17	(16% 19%)	217	13	(11% 14%)
	2008–2011	728	32	(30% 34%)	517	23	(21% 24%)	373	16	(15% 18%)	368	16	(15% 18%)	287	13	(11% 14%)
	2012–2015	1,051	37	(35% 39%)	573	20	(19% 22%)	465	16	(15% 18%)	406	14	(13% 16%)	349	12	(11% 13%)
	2016–2019	1,038	36	(34% 37%)	568	19	(18% 21%)	473	16	(15% 18%)	412	14	(13% 15%)	427	15	(13% 16%)
Asian/Pacific Islander	1992–1995	229	20	(18% 23%)	192	17	(15% 19%)	225	20	(18% 22%)	188	17	(14% 19%)	295	26	(24% 29%)
	1996–1999	342	23	(21% 25%)	302	20	(18% 22%)	324	22	(19% 24%)	272	18	(16% 20%)	266	18	(16% 20%)
	2000–2003	504	27	(25% 29%)	395	22	(20% 23%)	404	22	(20% 24%)	292	16	(14% 18%)	242	13	(12% 15%)
	2004–2007	720	32	(30% 34%)	483	21	(20% 23%)	480	21	(20% 23%)	350	16	(14% 17%)	221	10	(9% 11%)
	2008–2011	870	34	(32% 36%)	509	20	(18% 22%)	511	20	(19% 22%)	356	14	(13% 15%)	297	12	(10% 13%)
	2012–2015	1,057	40	(38% 41%)	459	17	(16% 19%)	526	20	(18% 21%)	383	14	(13% 16%)	250	9	(8% 10%)
	2016–2019	993	39	(38% 41%)	397	16	(14% 17%)	525	21	(19% 22%)	348	14	(12% 15%)	251	10	(9% 11%)
American Indian/Alaska Native	1992–1995	15	32	(19% 45%)	6	13	(3% 22%)	9	19	(8% 30%)	11	23	(11% 36%)	6	13	(3% 22%)
	1996–1999	15	34	(20% 48%)	10	23	(10% 35%)	6	14	(3% 24%)	≤5	9	(1% 18%)	9	20	(9% 32%)
	2000–2003	30	40	(29% 51%)	9	12	(5% 19%)	16	21	(12% 31%)	12	16	(8% 24%)	8	11	(4% 18%)
	2004–2007	35	28	(20% 36%)	33	26	(19% 34%)	18	14	(8% 21%)	20	16	(10% 22%)	19	15	(9% 21%)
	2008–2011	63	34	(27% 41%)	30	16	(11% 22%)	30	16	(11% 22%)	35	19	(13% 25%)	26	14	(9% 19%)
	2012–2015	94	43	(36% 49%)	40	18	(13% 23%)	39	18	(13% 23%)	29	13	(9% 18%)	19	9	(5% 12%)
	2016–2019	90	35	(29% 41%)	56	22	(17% 27%)	31	12	(8% 16%)	33	13	(9% 17%)	47	18	(14% 23%)
Men																
Non-Hispanic White	1992–1995	278	22	(20% 25%)	169	14	(12% 15%)	173	14	(12% 16%)	254	20	(18% 23%)	376	30	(28% 33%)
	1996–1999	362	23	(21% 25%)	285	18	(16% 20%)	236	15	(13,% .17%)	328	21	(19% 23%)	386	24	(22% 26%)
	2000–2003	547	29	(27% 31%)	388	20	(19% 22%)	327	17	(15% 19%)	355	19	(17% 20%)	286	15	(13% 17%)
	2004–2007	786	30	(28% 32%)	572	22	(20% 23%)	432	16	(15% 18%)	486	18	(17% 20%)	356	14	(12% 15%)
	2008–2011	1,157	32	(30% 33%)	797	22	(21% 23%)	666	18	(17% 20%)	653	18	(17% 19%)	347	10	(9% 11%)
	2012–2015	1,575	36	(35% 38%)	933	21	(20% 23%)	806	19	(17% 20%)	662	15	(14% 16%)	365	8	(8% 9%)
	2016–2019	1,558	38	(36% 39%)	753	18	(17% 19%)	728	18	(17% 19%)	690	17	(16% 18%)	388	9	(9% 10%)
Non-Hispanic Black	1992–1995	39	17	(13% 22%)	33	15	(13% 17%)	46	21	(18% 23%)	48	22	(19% 24%)	57	26	(23% 28%)
	1996–1999	50	16	(12% 20%)	66	21	(19% 23%)	64	20	(18% 22%)	70	22	(20% 24%)	66	21	(19% 23%)
	2000–2003	85	19	(15% 23%)	93	21	(19% 22%)	91	20	(18% 22%)	105	23	(21% 25%)	76	17	(15% 19%)
	2004–2007	184	27	(24% 30%)	136	20	(18% 21%)	137	20	(18% 21%)	170	25	(23% 26%)	59	9	(8% 10%)
	2008–2011	255	29	(26% 32%)	187	21	(20% 23%)	187	21	(20% 23%)	182	21	(19% 22%)	70	8	(7% 9%)
	2012–2015	358	33	(31% 36%)	198	19	(17% 20%)	217	20	(19% 21%)	206	19	(18% 20%)	91	9	(8% 9%)
	2016–2019	312	31	(28% 33%)	167	16	(15% 18%)	216	21	(20% 22%)	211	21	(19% 22%)	114	11	(10% 12%)

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Table 1 (*continued*)

		Stage 1			Stage 2			Stage 3			Stage 4			Stage unknown		
		Cases	%	95% CI	Cases	%	95% CI	Cases	%	95% CI	Cases	%	95% CI	Cases	%	95% CI
Hispanic	1992–1995	75	17	(15% 23%)	68	17	(14% 20%)	56	14	(12% 16%)	89	22	(19% 25%)	110	28	(25% 31%)
	1996–1999	134	16	(19% 25%)	120	20	(17% 22%)	84	14	(12% 16%)	123	20	(18% 23%)	148	24	(22% 27%)
	2000–2003	233	19	(24% 30%)	187	22	(19% 24%)	148	17	(15% 19%)	140	16	(14% 18%)	158	18	(16% 20%)
	2004–2007	360	27	(26% 30%)	288	22	(20% 24%)	236	18	(16% 20%)	242	19	(17% 21%)	158	12	(11% 14%)
	2008–2011	536	29	(29% 33%)	388	23	(21% 24%)	299	17	(16% 19%)	291	17	(15% 19%)	209	12	(11% 14%)
	2012–2015	733	33	(33% 37%)	423	20	(18% 22%)	363	17	(16% 19%)	319	15	(14% 17%)	265	13	(11% 14%)
	2016–2019	702	31	(31% 35%)	416	19	(18% 21%)	367	17	(15% 19%)	323	15	(13% 17%)	330	15	(14% 17%)
Asian/Pacific Islander	1992–1995	163	20	(17% 23%)	139	17	(3% 31%)	164	20	(5% 35%)	134	16	(2% 30%)	214	26	(10% 43%)
	1996–1999	251	23	(21% 26%)	213	20	(4% 35%)	240	22	(6% 38%)	203	19	(3% 34%)	183	17	(2% 31%)
	2000–2003	319	24	(22% 27%)	287	22	(11% 33%)	305	23	(12% 35%)	229	18	(7% 28%)	168	13	(4% 22%)
	2004–2007	495	30	(28% 33%)	351	22	(13% 30%)	373	23	(14% 32%)	269	17	(9% 24%)	142	9	(3% 15%)
	2008–2011	587	32	(30% 34%)	359	20	(13% 27%)	385	21	(14% 28%)	285	16	(9% 22%)	201	11	(6% 16%)
	2012–2015	714	37	(35% 39%)	343	18	(12% 24%)	398	21	(14% 27%)	313	16	(10% 22%)	158	8	(4% 13%)
	2016–2019	689	38	(35% 40%)	298	16	(11% 22%)	395	22	(16% 28%)	267	15	(9% 20%)	183	10	(6% 14%)
American Indian/Alaska Native	1992–1995	8	30	(12% 47%)	≤5	19	(13% 24%)	≤5	15	(10% 19%)	8	30	(24% 36%)	≤5	7	(4% 11%)
	1996–1999	8	32	(14% 50%)	6	24	(19% 29%)	≤5	12	(8% 16%)	≤5	8	(5% 11%)	6	24	(19% 29%)
	2000–2003	23	43	(30% 57%)	≤5	9	(7% 12%)	13	25	(21% 29%)	7	13	(10% 16%)	≤5	9	(7% 12%)
	2004–2007	24	28	(18% 37%)	23	26	(23% 30%)	12	14	(11% 16%)	16	18	(15% 21%)	12	14	(11% 16%)
	2008–2011	50	38	(30% 47%)	19	15	(12% 17%)	18	14	(12% 16%)	29	22	(20% 25%)	14	11	(9% 13%)
	2012–2015	56	37	(30% 45%)	29	19	(17% 22%)	31	21	(18% 23%)	24	16	(14% 18%)	10	7	(5% 8%)
	2016–2019	55	31	(24% 37%)	44	25	(22% 27%)	23	13	(11% 15%)	25	14	(12% 16%)	32	18	(16% 20%)
Women																
Non-Hispanic White	1992–1995	103	22	(18% 26%)	59	13	(10% 16%)	75	16	(13% 20%)	82	18	(14% 21%)	144	31	(27% 35%)
	1996–1999	144	25	(21% 28%)	100	17	(14% 20%)	92	16	(13% 19%)	92	16	(13% 19%)	151	26	(23% 30%)
	2000–2003	209	33	(29% 36%)	111	17	(14% 20%)	103	16	(13% 19%)	110	17	(14% 20%)	110	17	(14% 20%)
	2004–2007	247	33	(30% 36%)	161	22	(19% 25%)	113	15	(13% 18%)	123	16	(14% 19%)	103	14	(11% 16%)
	2008–2011	343	36	(33% 39%)	218	23	(20% 25%)	169	18	(15% 20%)	150	16	(13% 18%)	80	8	(7% 10%)
	2012–2015	477	42	(39% 45%)	224	20	(18% 22%)	167	15	(13% 17%)	163	14	(12% 17%)	96	9	(7% 10%)
	2016–2019	509	44	(41% 47%)	197	17	(15% 19%)	189	16	(14% 18%)	153	13	(11% 15%)	107	9	(8% 11%)
Non-Hispanic Black	1992–1995	18	22	(13% 31%)	7	9	(2% 15%)	9	11	(4% 18%)	24	29	(19% 39%)	24	29	(19% 39%)
	1996–1999	30	24	(17% 32%)	27	22	(15% 29%)	15	12	(6% 18%)	29	23	(16% 31%)	23	19	(12% 25%)
	2000–2003	39	30	(22% 38%)	26	20	(13% 27%)	28	22	(15% 29%)	20	16	(9% 22%)	16	12	(7% 18%)
	2004–2007	63	32	(25% 38%)	41	21	(15% 26%)	44	22	(16% 28%)	38	19	(14% 24%)	14	7	(3% 11%)
	2008–2011	90	37	(31% 43%)	38	16	(11% 20%)	45	18	(14% 23%)	36	15	(10% 19%)	35	14	(10% 19%)
	2012–2015	130	41	(35% 46%)	65	20	(16% 25%)	55	17	(13% 21%)	45	14	(10% 18%)	25	8	(5% 11%)
	2016–2019	127	37	(32% 42%)	57	16	(13% 20%)	79	23	(18% 27%)	62	18	(14% 22%)	22	6	(4% 9%)
Hispanic	1992–1995	45	32	(24% 39%)	23	16	(10% 22%)	15	11	(6% 16%)	24	17	(11% 23%)	35	25	(18% 32%)
	1996–1999	72	31	(25% 37%)	32	14	(9% 18%)	38	16	(12% 21%)	34	15	(10% 19%)	57	24	(19% 30%)
	2000–2003	100	32	(27% 38%)	69	22	(18% 27%)	37	12	(8% 16%)	54	17	(13% 22%)	49	16	(12% 20%)
	2004–2007	159	38	(33% 43%)	72	17	(14% 21%)	72	17	(14% 21%)	55	13	(10% 16%)	59	14	(11% 17%)
	2008–2011	192	35	(31% 39%)	129	23	(20% 27%)	74	13	(11% 16%)	77	14	(11% 17%)	78	14	(11% 17%)
	2012–2015	318	43	(39% 46%)	150	20	(17% 23%)	102	14	(11% 16%)	87	12	(9% 14%)	84	11	(9% 14%)
	2016–2019	336	43	(40% 47%)	152	19	(17% 22%)	106	14	(11% 16%)	89	11	(9% 14%)	97	12	(10% 15%)
Asian/Pacific Islander	1992–1995	66	21	(16% 25%)	53	17	(13% 21%)	61	19	(15% 24%)	54	17	(13% 21%)	≤5	26	(21% 31%)
	1996–1999	91	22	(18% 26%)	89	21	(17% 25%)	84	20	(16% 24%)	69	17	(13% 20%)	≤5	20	(16% 24%)
	2000–2003	185	35	(31% 39%)	108	20	(17% 24%)	99	19	(15% 22%)	63	12	(9% 15%)	≤5	14	(11% 17%)
	2004–2007	225	36	(32% 40%)	132	21	(18% 24%)	107	17	(14% 20%)	81	13	(10% 16%)	7	13	(10% 15%)
	2008–2011	283	39	(35% 43%)	150	21	(18% 24%)	126	17	(15% 20%)	71	10	(8% 12%)	12	13	(11% 16%)
	2012–2015	343	46	(42% 49%)	116	15	(13% 18%)	128	17	(14% 20%)	70	9	(7% 11%)	9	12	(10% 15%)
	2016–2019	304	45	(41% 48%)	99	15	(12% 17%)	130	19	(16% 22%)	81	12	(9% 14%)	15	10	(8% 12%)

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Table 1 (*continued*)

		Stage 1			Stage 2			Stage 3			Stage 4			Stage unknown		
		Cases	%	95% CI	Cases	%	95% CI	Cases	%	95% CI	Cases	%	95% CI	Cases	%	95% CI
American Indian/Alaska Native	1992–1995	7	35	(14% 56%)	≤5	5	(0% 15%)	≤5	25	(6% 44%)	≤5	15	(0% 31%)	≤5	20	(2% 38%)
	1996–1999	7	37	(15% 59%)	≤5	21	(3% 39%)	≤5	16	(0% 32%)	≤5	11	(0% 24%)	≤5	16	(0% 32%)
	2000–2003	7	32	(12% 51%)	≤5	18	(2% 34%)	≤5	14	(0% 28%)	≤5	23	(5% 40%)	≤5	14	(0% 28%)
	2004–2007	11	29	(15% 43%)	10	26	(12% 40%)	6	16	(4% 27%)	≤5	11	(1% 20%)	7	18	(6% 31%)
	2008–2011	13	24	(13% 35%)	11	20	(10% 31%)	12	22	(11% 33%)	6	11	(3% 19%)	12	22	(11% 33%)
	2012–2015	38	54	(42% 65%)	11	15	(7% 24%)	8	11	(4% 19%)	≤5	7	(1% 13%)	9	13	(5% 20%)
	2016–2019	35	45	(34% 56%)	12	15	(7% 23%)	8	10	(4% 17%)	8	10	(4% 17%)	15	19	(10% 28%)

SEER, Surveillance, Epidemiology and End Results.

CIs for each proportion were estimated using a binomial distribution. In addition, age-standardised incidence rates (ASRs) were calculated by race/ethnicity and sex for the entire study period, and trends in incidence were analysed using Joinpoint regression to estimate annual percent change (APC). All rates were adjusted using the direct method to the 2000 United States standard population (19 age groups).

Results

Between 1992–1995 and 2016–2019, favourable trends in stage distribution were seen among NHW, NHB, Hispanic, and API persons (Table 1). Among these groups, the proportion of HCCs diagnosed at stage 1 increased, whereas the proportions diagnosed at stages 2 and 3 remained stable, and the proportions diagnosed at stage 4 decreased. The largest increase in stage 1, from 20% (95% CI 18–23%) to 39% (95% CI 38–41%), was observed among API persons. The greatest decrease in stage 4 HCCs, from 21 to 14%, was seen among Hispanic persons (Fig. S1). Despite the favourable trends among these groups, in the most recent time period, NHB persons had a lower proportion of stage 1 HCCs (32%) and a higher proportion of stage 4 HCCs (20%) than the other three groups.

HCC stage trends among AI/AN persons were less favourable than those among the other four groups. The proportion of stage 1 disease remained stable, whereas the proportion of stage 2 HCCs increased from 13% (95% CI 3–22%) to 22% (95% CI 17–27%). The proportions of stages 3 and 4 HCCs both declined, from 19% (95% CI 8–30%) to 12% (95% CI 8–16%) and from 23% (95% CI 11–36%) to 13% (95% CI 9–17%), respectively. Even with less favourable trends, however, AI/AN persons still had a higher proportion of stage 1 HCCs (35%; 95% CI 29–41%) and a lower proportion of stage 4 HCCs (13%; 95% CI 9–17%) than did NHB persons.

Stratification by sex found that API women had the largest increase in stage 1 HCC, from 21% (95% CI 16–25%) to 45% (95% CI 41–48%), whereas the greatest decrease in stage 4 HCC, from 29% (95% CI 19–39%) to 18% (95% CI 14–22%), was observed among NHB women. No reduction in stage 4 HCC was observed among NHB or API men.

The Joinpoint regression analyses found that HCC incidence rates significantly declined between 2015 and 2019 (APC -4.6%) (Table S1). The decline occurred in both sexes, but the decrease was greater among men ($APC_{2015–2019}$ -5.4%) than among women ($APC_{2013–2019}$ -2.8%). Significant declines in incidence rates were observed among API ($APC_{2010-2019}$ -4.6%), Hispanic ($APC_{2012–2019}$ -2.9%), and NHW individuals ($APC_{2013-2019}$ -2.7%). Although a slight decline ($APC_{2009–2019}$ -1.0%) was observed among NHB persons, the result was not statistically significant. In contrast to the trends among the other groups, rates among AI/AN persons significantly increased ($APC_{1992–2019}$ 4.0%). In 2019, HCC incidence rates were highest in AI/AN persons (ASR 12.12), followed by Hispanic persons (ASR 9.33).

Discussion

Our findings, using the new SEER staging-over-time variable, are consistent with some, but not all, prior analyses of racial/ethnic differences in SEER data. For example, a previous study in which HCC stage was categorised as local, regional, distant, and unstaged did not examine trends over time, but it did report that

NHB persons had the highest proportion of distant-stage HCC during the period 2000–2015.[7] The finding of NHB persons being less likely than other groups to have early-stage disease has been replicated in a number of other studies, as reported by a recent meta-analysis.[8] In contrast, a study that used SEER data to examine HCC stage between 2004 and 2019 reported that although local-stage HCC significantly declined in all groups, distant-stage HCC increased among NHW persons between 2014 and 2019.[5] This finding could differ from that of the current study owing to less precise stage data than are available in the new staging-over-time variable.

Although the current study found favourable HCC stage trends among most groups, differences in stage among the groups were evident. These differences could be related to disparities in surveillance. A recent study reported that NHB persons were less likely than other groups to be screened for HCC, whereas persons with HBV infection were more likely to be screened.[9] As HBV has been a dominant risk factor among API persons, screening in this group may be substantially more likely.[10]

In conclusion, although favourable trends in HCC stage were seen for many racial/ethnic groups, differences in the stage distribution of HCC were apparent. Particular attention should be paid to rectifying the lower proportion of stage 1 disease and higher proportion of stage 4 disease among NHB persons and the less favourable trends in stage seen among AI/AN persons. Efforts to reduce the HCC burden among all segments of the American population are clearly warranted.

Abbreviations

A/PI, Asian/Pacific Islander; AI/AN, American Indian/Alaska Native; APC, annual percent change; ASR, age-standardised incidence rate; HCC, hepatocellular carcinoma; NHB, non-Hispanic Black; NHW, non-Hispanic White; SEER, Surveillance, Epidemiology and End Results.

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Conflicts of Interest

None of the authors have any conflicts of interest.

Please refer to the accompanying ICMJE disclosure forms for further details.

Authors' contributions

Conception: KAM. Data analysis: CSA. Data acquisition: JR. Data manipulation: GF. Supervision: BIG, KAM. Writing of the manuscript: CSA. Editing of the manuscript: CSA. Reading of the manuscript: GF. Reviewing of the manuscript: JR, GF, BIG, KAM.

Data availability statement

Data used in this study are publicly available at www.seer.cancer.gov. SEER*Stat Database: Incidence – SEER Research Data, 12 Registries, Nov 2021 Sub (1992–2019).

Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jhepr.2023.100868.

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