2021 HEPATOCELLULAR CARCINOMA FACTSHEET IN KOREA
This factsheet was made by mutual cooperation and research between National Health Insurance Service (NHIS) and Korean Association for the Study of the Liver (KASL) based on MOU.

Data source and HCC definition

Subjects Patients who were newly diagnosed with hepatocellular carcinoma (HCC) between 2008 and 2018 from KNHIS database

HCC definition C220 (ICD code) and V193 (rare incurable disease code)

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Hepatocellular carcinoma (HCC) is the sixth most common cancer in Korea. As the incidence remains high, and as the prognosis is poor, accurate data on current HCC status are essential when establishing healthcare policy and prioritizing limited resources. Thus, we are very pleased to present a factsheet entitled “2021 hepatocellular carcinoma in Korea”. This includes information on HCC incidence, etiology, comorbidities, and treatment over a recent 10-year interval (2008-2018). The factsheet was prepared by the Korean Association for the Study of the Liver (KASL) and the National Health Insurance Service (NHIS) based on MOU (grant no. NHIS-2021-1-096). The factsheet accurately presents the current status of HCC in Korea. We are grateful to the NHIS and the research committee of the KASL.

Greetings

April 2021

President of the Korean Association for Study of the Liver: Han Chu Lee
Chairman of the Korean Association for Study of the Liver: Dong Joon Kim
**Incidence of HCC (2018)**

Incidence of HCC: Patients newly diagnosed with HCC from Korean National Health Insurance Service (KNHIS) database

Definition of HCC: International Classification of Diseases (ICD) code of C220 and rare incurable disease code of V193 (severe cancer)

*Standard population: population covered by health insurance in 2005

**Crude rate** (per 100,000 person-years)

**Age-standardized rate** (per 100,000 person-years)

**Number of new HCC cases (2018)**

The highest number of cases in 50-69 years

The rapid increase of cases from 40+ years
The highest crude incidence rate
60-79 years

Crude incidence rate of HCC by age (2018)

Crude incidence rate of HCC by region (2018)
Crude incidence rate of HCC by income level (2018)

- Medicare: exemption from paying insurance
- The health insurance group with 20 categories were re-grouped into 4 categories (Q1-5, Q6-10, Q15-20, Q16-20).
- Q16-20: highest income group
- Q1-5: lowest income group

<table>
<thead>
<tr>
<th>Medicare</th>
<th>Q1-5</th>
<th>Q6-10</th>
<th>Q11-15</th>
<th>Q16-20</th>
</tr>
</thead>
<tbody>
<tr>
<td>33.4</td>
<td>23.6</td>
<td>17.2</td>
<td>20.0</td>
<td>18.9</td>
</tr>
</tbody>
</table>

Rate per 100,000 person-years

Changes of crude incidence rate of HCC in recent 10 years (2008-2018)

Average of crude incidence rate of HCC

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>37.3</td>
<td>33.1</td>
<td>33.1</td>
<td>33.1</td>
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<td>33.1</td>
<td>33.1</td>
<td>33.1</td>
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</tr>
<tr>
<td>Female</td>
<td>10.5</td>
<td>9.3</td>
<td>9.3</td>
<td>9.3</td>
<td>9.3</td>
<td>9.3</td>
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<td>9.3</td>
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<td>9.3</td>
</tr>
</tbody>
</table>

Rate per 100,000 person-years
Changes of HCC cases in recent 10 years (2008-2018)

Number of new HCC cases did not decrease

Changes of crude incidence rate of HCC by age in recent 10 years (2008-2018)

>80 years

+6.1% per year

(Average annual percent change)
### Crude incidence rate of HCC by region (2008 vs. 2018)

<table>
<thead>
<tr>
<th>Region</th>
<th>2008</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jeollabuk-do</td>
<td>26.0</td>
<td>22.8</td>
</tr>
<tr>
<td>Gyeongsangnam-do</td>
<td>26.7</td>
<td>22.8</td>
</tr>
<tr>
<td>Jeollanam-do</td>
<td>31.3</td>
<td>24.8</td>
</tr>
<tr>
<td>Gyeongsangbuk-do</td>
<td>26.3</td>
<td>22.7</td>
</tr>
<tr>
<td>Chungcheongbuk-do</td>
<td>21.7</td>
<td>19.8</td>
</tr>
<tr>
<td>Chungcheongnam-do</td>
<td>24.2</td>
<td>19.8</td>
</tr>
<tr>
<td>Jeju-do</td>
<td>30.4</td>
<td>24.3</td>
</tr>
<tr>
<td>Gangwon-do</td>
<td>30.2</td>
<td>28.3</td>
</tr>
<tr>
<td>Gyeonggi-do</td>
<td>19.9</td>
<td>18.7</td>
</tr>
<tr>
<td>SeouI</td>
<td>22.2</td>
<td>19.3</td>
</tr>
</tbody>
</table>

### Crude incidence rate of HCC by income level

#### Medicare (average annual percent change)

<table>
<thead>
<tr>
<th>Year</th>
<th>Rate (per 100,000 person-years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>28.20</td>
</tr>
<tr>
<td>2009</td>
<td>25.85</td>
</tr>
<tr>
<td>2010</td>
<td>23.70</td>
</tr>
<tr>
<td>2011</td>
<td>22.80</td>
</tr>
<tr>
<td>2012</td>
<td>20.04 Q1-5</td>
</tr>
<tr>
<td>2013</td>
<td>18.86 Q16-20</td>
</tr>
<tr>
<td>2014</td>
<td>17.14 Q6-10</td>
</tr>
<tr>
<td>2015</td>
<td>23.57 Q1-5</td>
</tr>
<tr>
<td>2016</td>
<td>25.85</td>
</tr>
<tr>
<td>2017</td>
<td>17.02</td>
</tr>
<tr>
<td>2018</td>
<td>33.40 Medicare +5.2%/year</td>
</tr>
</tbody>
</table>
Etiology and co-morbidities of HCC

Etiology of HCC (2008-2018)
- Liver cirrhosis in HCC (2008-2018)
- Chronic kidney disease in HCC (2008-2018)
- Type 2 diabetes mellitus in HCC (2008-2018)
- Hypertension in HCC (2008-2018)
- Other malignancies in HCC (2008-2018)
- Cardiovascular disease in HCC (2008-2018)
- Cerebrovascular disease in HCC (2008-2018)

Data source
- Data from 2008-2018
- Korean National Health Insurance Service (KNHIS)
Etiology of HCC (2008 vs. 2018)

- 2008:
  - HBV: 62.5%
  - HCV: 9.1%
  - NAFLD: 9.9%
  - Alcohol: 8.7%
  - Others: 9.7%

- 2018:
  - HBV: 58.4%
  - HCV: 13.6%
  - NAFLD: 10.0%
  - Alcohol: 12.3%
  - Others: 5.8%

Liver cirrhosis in HCC (2008-2018)

- 2008: 75.7%
- 2009: 76.8%
- 2010: 75.7%
- 2011: 76.6%
- 2012: 76.8%
- 2013: 76.3%
- 2014: 77.1%
- 2015: 76.6%
- 2016: 74.6%
- 2017: 73.9%
- 2018: 73.7%

The graph shows the percentage of liver cirrhosis in HCC from 2008 to 2018, with 2018 having the highest percentage at 73.7%.
Chronic kidney disease in HCC (2008-2018)

Type 2 diabetes mellitus in HCC (2008-2018)
Hypertension in HCC (2008-2018)

Other malignancies in HCC (2008-2018)

- **Hypertension in HCC (2008-2018)**: The percentage of hypertensive patients in HCC has been increasing over the years, with a peak of 56.7% in 2018.

- **Other Malignancies in HCC (2008-2018)**: Other malignancies have been identified in HCC patients, with a trend of decreasing incidence from 2008 to 2018, reaching a low of 5.1% in 2018.

### Graphs

- **Hypertension in HCC (2008-2018)**: A line graph showing the percentage of hypertensive HCC patients from 2008 to 2018, with a steady increase to 56.7% in 2018.

- **Other Malignancies in HCC (2008-2018)**: A bar graph showing the percentage of other malignancies in HCC patients from 2008 to 2018, with a decreasing trend from 6.7% in 2008 to 5.1% in 2018.
Cardiovascular disease in HCC (2008-2018)

- 2018: 13.9%

Cerebrovascular disease in HCC (2008-2018)

- 2018: 7.8%
Annual trends of antiviral treatment rates at the time of hepatitis B virus-related HCC diagnosis

Annual antiviral treatment rates in hepatitis B virus-related HCC by gender

Data source
Data from 2008-2018, Korean National Health Insurance Service (KNHIS)

Antiviral treatment rate

Pre-HCC NA 31.4%
Post-HCC NA 38.3%
No NA 30.3%

Antiviral treatment rate (pre-HCC NA+ post HCC NA)

[2008] 39.3% → [2018] 69.7%

NA, nucleos(t)ide analogue
Annual antiviral treatment rates in patients with hepatitis B virus-related HCC by gender

Treatment of HCC
Primary treatment of HCC (2008 vs. 2018)
Changes in the primary treatment of HCC in recent 10 years (2008-2018)

Data source
Data from 2008-2018, Korean National Health Insurance Service (KNHIS)
Primary treatment of HCC (2008 vs. 2018)

<table>
<thead>
<tr>
<th>Primary Treatment</th>
<th>2008</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transarterial therapy</td>
<td>48.2%</td>
<td>38.6%</td>
</tr>
<tr>
<td>Best supportive care</td>
<td>31.7%</td>
<td>22.3%</td>
</tr>
<tr>
<td>Liver transplantation</td>
<td>1.0%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Local ablation therapy</td>
<td>3.8%</td>
<td>8.4%</td>
</tr>
<tr>
<td>Radiation therapy</td>
<td>1.7%</td>
<td>2.1%</td>
</tr>
<tr>
<td>Systemic therapy</td>
<td>2.0%</td>
<td>6.9%</td>
</tr>
</tbody>
</table>

Changes in the primary treatment of HCC in recent 10 years (2008-2018)

- Liver transplantation: 1.0% (2008) vs. 1.0% (2018)
- Local ablation therapy: 8.4% (2018) vs. 3.8% (2008)
- Best supportive care: 22.3% (2018) vs. 31.7% (2008)
- Surgical resection: 20.6% (2018) vs. 11.6% (2008)
- Transarterial therapy: 38.6% (2018) vs. 48.2% (2008)
- Radiation therapy: 2.1% (2018) vs. 1.7% (2008)
- Systemic therapy: 6.9% (2018) vs. 2.0% (2008)
- Best supportive care: 22.3% (2018) vs. 31.7% (2008)