**Population Characteristics from Truven**

|  |  |  |
| --- | --- | --- |
| **1. Breakdown of overall MASLD patients (no diagnosis code for cirrhosis at MASLD diagnosis)** | | |
| Overall (N= 859970) | Male | Female |
| Age <50 | 187674 (21.8%) | 179391 (20.9%) |
| Age >=50 | 222642 (25.9%) | 270263 (31.4%) |
| **2. Breakdown of patients who were diagnosed with cirrhosis before HCC**  (These patients will be censored.) | | |
| Diagnosed cirrhosis (N = 993) | Male | Female |
| Age <50 | 69 (6.9%) | 41 (4.1%) |
| Age >=50 | 587 (59.1%) | 236 (23.8%) |
| **3. N(%) of patients with undiagnosed cirrhosis** (PLT<140 or FIB-4>=2.67 w/o cirrhosis diagnosis) | 2,236 (5.9%) – Winnie, could you clarify if this is the % out of our final MASLD cohort who have PLT/FIB-4 data? | |
| **4.** **Breakdown of patients who develop HCC (exclude pts who get diagnosed with cirrhosis before HCC)** | | |
| HCC (N=804) | Male | Female |
| Age <50 | 67 (8.3%) | 69 (8.6%) |
| Age >=50 | 442 (55.0%) | 226 (28.1%) |
| **5.** **Breakdown of HCC patients who die (exclude pts who get diagnosed with cirrhosis before HCC)** | | |
| Death (N=) | Male | Female |
| Age <50 | N (%) | N (%) |
| Age >=50 | N (%) | N (%) |

**Please find the following in literature:**

**Annual incidence in MASLD patients:**

|  |  |  |
| --- | --- | --- |
|  | **Annual Incidence %** | **Reference from literature** |
| No cirrhosis to cirrhosis | 0.006 =0.6% -- Please double check this. In the paper, it seems like this is % increase in proportion of NAFLD etiology among a cohort of cirrhosis patients of any cause.  I found this statistic:  10.85 per 1,000 person-years  [Global incidence of adverse clinical events in non-alcoholic fatty liver disease: A systematic review and meta-analysis - PMC (nih.gov)](https://pmc.ncbi.nlm.nih.gov/articles/PMC11016479/) | Huang 2023 |
| No cirrhosis to HCC (any stage) | 1.1 per 1000 person-years  (around 1.1% after conversion)  0.7-1.2 per 1000 PY ([Incidence of hepatocellular carcinoma in nonalcoholic fatty liver disease without cirrhosis or advanced liver fibrosis - PMC](https://pmc.ncbi.nlm.nih.gov/articles/PMC10319365/))  0.08 per 1000 PY ([Risk of Hepatocellular Cancer in Patients with Non-alcoholic Fatty Liver Disease - PMC](https://pmc.ncbi.nlm.nih.gov/articles/PMC6279617/)) | Behari 2023 |
| Compensated cirrhosis to HCC (we use this to account for undiagnosed cirrhosis cases) | 0.043 =4.3%  (please ensure this is HCC incidence of MASLD with compensated cirrhosis to HCC, as we specify these numbers should be for MASLD patients in the table title)  I found this paper report annual incidence of 2.6%  [The incidence and risk factors of hepatocellular carcinoma in patients with nonalcoholic steatohepatitis - PubMed (nih.gov)](https://pubmed.ncbi.nlm.nih.gov/20209604/),  [Global epidemiology of NAFLD-related HCC: trends, predictions, risk factors and prevention | Nature Reviews Gastroenterology & Hepatology](https://www.nature.com/articles/s41575-020-00381-6)  This paper reports 10.6/1000PY in NAFLD cirrhosis, which is 1.054%  [Risk of Hepatocellular Cancer in Patients with Non-alcoholic Fatty Liver Disease - PMC](https://pmc.ncbi.nlm.nih.gov/articles/PMC6279617/) | Lee 2021 |
| Accidental diagnosis of HCC (in patients who are not screened) | 0.0013 =0.13% (This is annual HCC incidence overall for non-cirrhotic MASLD)  Please don’t worry about this statistic--But, I’m realizing that we actually don’t need a separate HCC incidence for accidental diagnosis so please don’t worry about this one. | Dahan 2022 |
| HCC recurrence after curative treatment  (We will define as transplant, resection, and ablation for early stage HCC. Zane, World J Hepatol. 2022) | 0.5 =50%--From looking at the reference, I think this is the overall incidence or maybe 5 year, not annual. But, recurrence would vary widely by treatment type and liver cancer stage so we could leave this node out. Recurrence could be accounted for in the survival data. | Abdelhamed 2023 |

**HCC stage upon diagnosis:**

|  |  |  |
| --- | --- | --- |
|  | **% Value** | **Reference from literature** |
| **Without HCC screening** | | |
| % Early stage | **45.7%** | ~~Parikh 2022~~  Reference should be Daher 2024 |
| % Intermediate stage | **23.0%** |
| % Late stage | **31.3%** |
| **With HCC screening** | | |
| % Early stage | **70.7%** | **Daher 2024** |
| % Intermediate stage | **15.6%** |
| % Late stage | **13.7%** |

(\*We assume that the age and sex distribution will be uniform across the above HCC stages upon diagnosis)

**Breakdown of HCC treatment received by HCC stage** (newly added)

|  |  |  |
| --- | --- | --- |
|  | **% of patients given each treatment** | **Reference from literature** |
| Early stage HCC |  |  |
| Transplant |  |  |
| Resection |  |  |
| TACE |  |  |
| Ablation |  |  |
| Systemic chemotherapy |  |  |
| Radiotherapy |  |  |
| Untreated |  |  |
| Intermediate stage HCC |  |  |
| Transplant |  |  |
| Resection |  |  |
| TACE |  |  |
| Ablation |  |  |
| Systemic chemotherapy |  |  |
| Radiotherapy |  |  |
| Untreated |  |  |
| Late stage HCC |  |  |
| TACE |  |  |
| Ablation |  |  |
| Systemic chemotherapy |  |  |
| Radiotherapy |  |  |
| Palliative care |  |  |
| Untreated |  |  |

**Annual rate of death in MASLD patients:** Winnie will revise to report original data (5-year survival rate, person-years, etc.), Sovann will convert to annual probability.

|  |  |  |
| --- | --- | --- |
|  | **Annual Mortality %** | **Reference from literature** |
| No cirrhosis | 0.203 = 20.3% | Leyh 2024 |
| Compensated cirrhosis (we use this to account for undiagnosed cirrhosis cases) | 0.036 = 3.6% | Wang 2023 |
| Early stage HCC |  |  |
| After Transplant | 0.40 = 40% | American cancer society data |
| After resection | 0.45 = 45% | Thornton 2022 |
| After TACE | 0.399 =39.9% | Kim 2017 |
| After ablation | 0.636 = 63.6% | Zhang 2021 |
| After systemic chemotherapy | 0.56 = 56% | Leowattana 2023 |
| After radiotherapy | 0.296 = 29.6% | Hara 2019 |
| Untreated | 0.873 = 87.3% | Edoardo 2015 |
| Intermediate stage HCC |  |  |
| After Transplant | 0.20 = 20% | Kamo 2018 |
| After resection | 0.53 = 53% | Zhong 2015 |
| After TACE | 0.68 = 68% | Prince 2020 |
| After ablation | 0.60 = 60% | Tanaka 2023 |
| After systemic chemotherapy | 0.50 = 50% | Forner 2014 |
| After radiotherapy | 0.37 = 37% | Prince 2020 |
| Untreated | 0.86 = 86% | American cancer society data |
| Late stage HCC |  |  |
| After TACE | 0.931 = 93.1% | Kong 2018 |
| After ablation | 1.00 = 100% | Yang 2016 |
| After systemic chemotherapy | 0.90 = 90% | Nakamura 2023 |
| After radiotherapy | 0.937 = 93.7% | Lin 2019 |
| Untreated | 0.96 = 96% | American cancer society data |

**Sensitivity/Specificity of HCC screening from literature**

|  |  |  |
| --- | --- | --- |
| **Probability** | **Value** | **Reference from literature** |
| Sensitivity of US/AFP | 0.851 = 85.1% | Singal 2022 |
| Specificity of US/AFP | 0.839 = 83.9% | Singal 2022 |

**Quality of life by health state from literature**

|  |  |  |
| --- | --- | --- |
| **Health State** | **Utility** | **Reference from literature** |
| No cirrhosis | 0.85 – According to the reference this is for compensated cirrhosis. Could you find the utility for non-cirrhotic MASLD? | Singal 2024 |
| False positive HCC | 0.77 | Singal 2024 |
| Early stage HCC | 0.72 | Singal 2024 |
| Intermediate stage HCC | 0.69 | Singal 2024 |
| Late stage HCC | 0.65 | Singal 2024 |
| ~~Death~~ Palliative Care | 0.40 | Singal 2024 |

**Costs from literature**

|  |  |  |
| --- | --- | --- |
| **Cost** | **Value** | **Reference from literature** |
| US+AFP screening | $179 | Medicare fee  schedule |
| Repeat CT/MRI for false positive HCC | $554 | Medicare fee  schedule |
| Medical care of patients with non-cirrhotic MASLD | $3537 (2020) | Younossi 2023 |
| Liver transplant | $62432 | Medicare fee  schedule |
| Early stage HCC | $62,340 | Karim 2023 – This reference doesn’t include data on any costs. Please double check |
| Intermediate stage HCC | $116,996– I’m not sure how this number was derived. Could you clarify? | Tapper 2016 |
| Late stage HCC | $105,591– I’m not sure how this number was derived. Could you clarify? | Tapper 2016 |
| Resection | $25,614 | Charalel 2024 |
| TACE | $51,696 | Nugent 2018 |
| Ablation | $6,689 | Charalel 2024 |
| Systemic chemotherapy in early stage HCC | $10,469– I’m not sure how this number was derived. Could you clarify? | Shankaran 2021 |
| Systemic chemotherapy in intermediate stage HCC | $10,209– I’m not sure how this number was derived. Could you clarify? | Shankaran 2021 |
| Systemic chemotherapy in late stage HCC | $24,953– I’m not sure how this number was derived. Could you clarify? | Shankaran 2021 |
| Radiotherapy | $15,148 | deBettencourt 2024 |