# GENIE BPC PANCREATIC CANCER OVERVIEW

**2023**

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# Release Notes

- **PRISSMM™:** the BPC PANC dataset uses the PRISSMM™ framework developed at the Dana-Farber Cancer Institute to determine outcomes from retrospective real-world data to ascertain cancer treatment responses in the real world. Additional information can be found in the analytic data guide and information about licensing PRISSMM™ can be obtained by emailing PRISSMM@mskcc.org

- **Pathologic information:** Each pathology specimen from diagnosis through death or last follow-up is curated with specimen type, site, and histology.

- **Imaging information:** Each CT, MRI, PET-CT scan from diagnosis through death or last follow-up is curated for the presence or absence of cancer and an evaluation of whether the cancer was stable, responding, or progressing.

- **Medical oncologist's evaluations:** Medical oncology notes (1/month) have been curated to ascertain the presence or absence of cancer and whether the cancer was stable, responding, or progressing.

- **Additional relevant biomarkers:** Information about select biomarkers not included on the NGS panels, including PDL1, PD1 and MSI, are also curated.

- PANC cancer diagnosis is considered the index tumor for this patient cohort. There are data about other cancer diagnoses antecedent to the PANC and subsequent to the PANC diagnosis.

# GENIE BPC Data Model



n

- Pancancer
  - PDL1
  - MSI
- Cancer-specific

Treatments

- Rx
  - INN
  - Start date
  - Stop date

^

OUTCOMES

PRISSMM *

- rwOS
- rwDFS
- rwPFS
- rwTTNT
- rwTTD
- rwTTR

- Demographics
- Smoking status
- Vital status
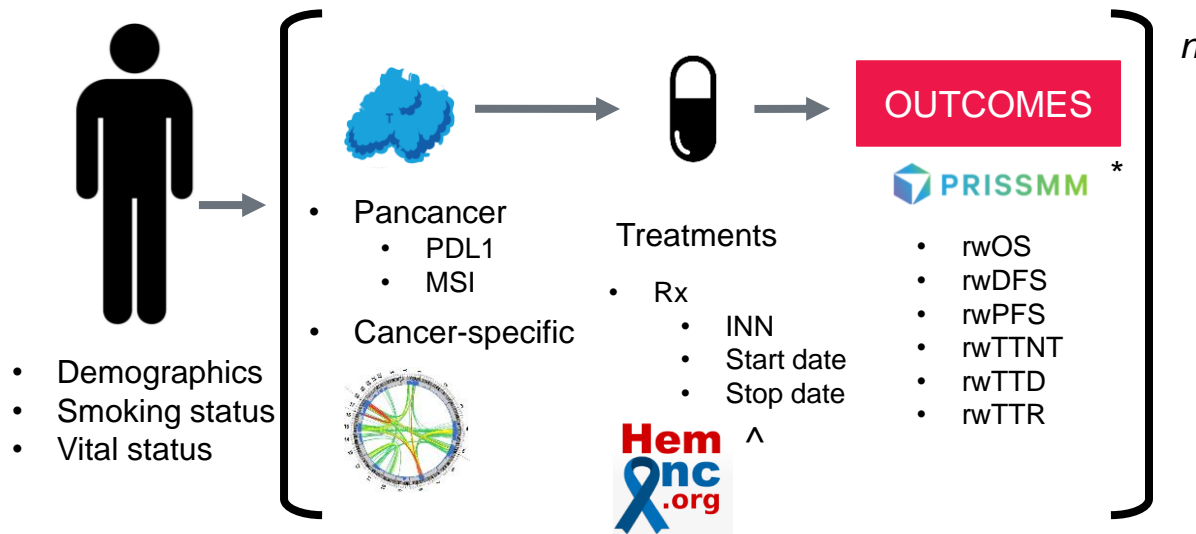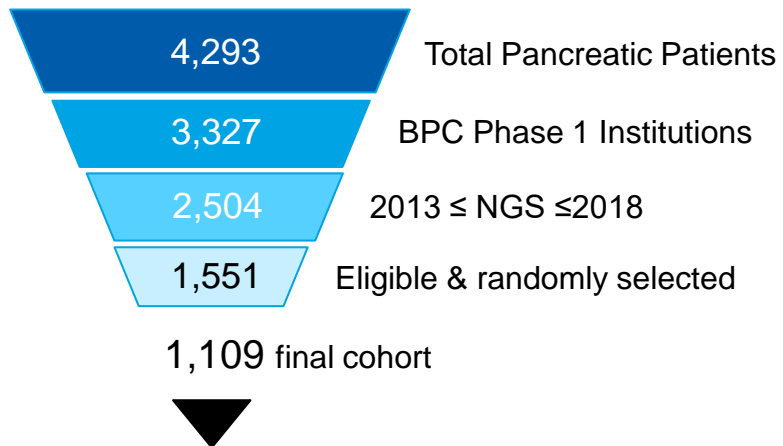
*PRISSMM is licensed from the DFCI
^HemOnc is available through a creative commons license

# BPC Pancreatic Cohort

| | |
|---|---|
| 4,293 | Total Pancreatic Patients |
| 3,327 | BPC Phase 1 Institutions |
| 2,504 | 2013 ≤ NGS ≤2018 |
| 1,551 | Eligible & randomly selected |

1,109 final cohort

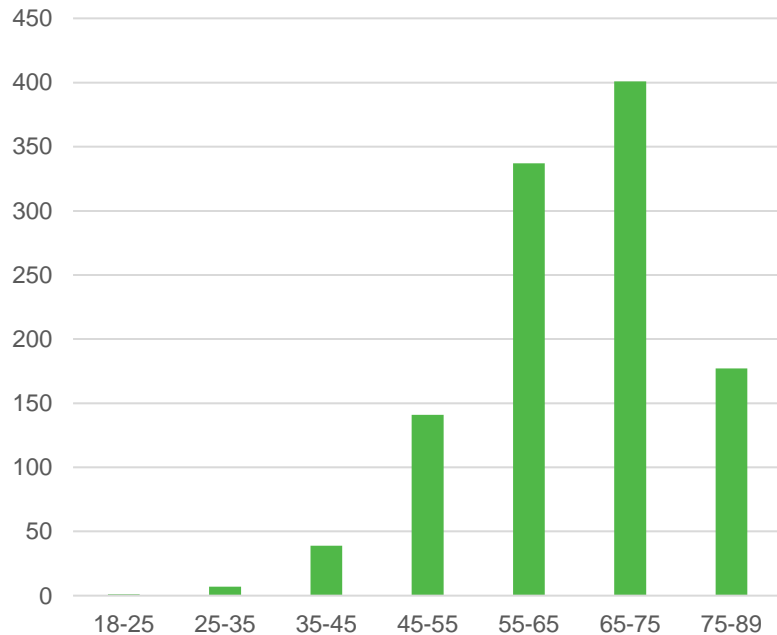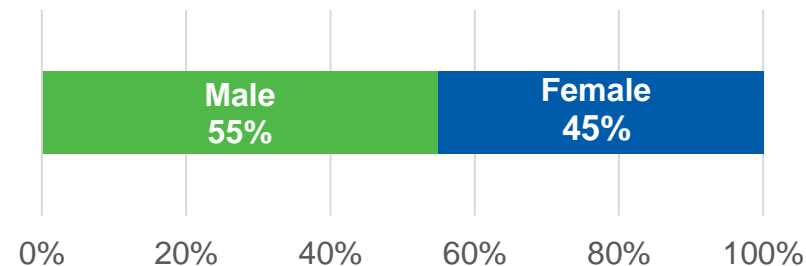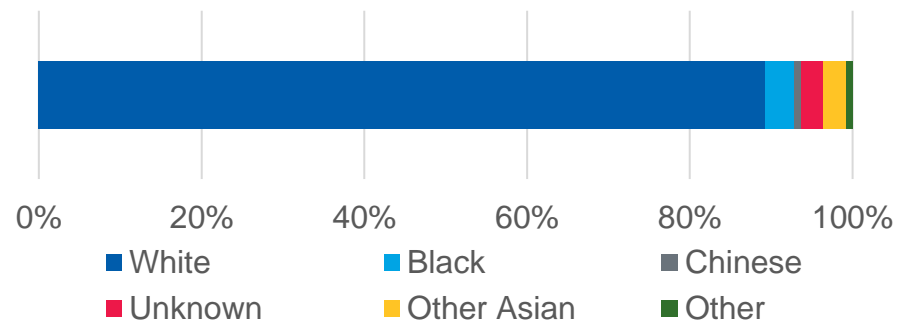| | |
|---|---|
| Pancreatic Adenocarcinoma | 1,075 |
| Adenosquamous Carcinoma of the Pancreas | 24 |
| Acinar Cell Carcinoma of the Pancreas | 23 |
| Undifferentiated Carcinoma of the Pancreas | 8 |

## Cancer Types

Undifferentiated Carcinoma of the Pancreas 1%

Pancreatic Adenocarcinoma 95%

Acinar Cell Carcinoma of the Pancreas 2%

Adenosquamous Carcinoma of the Pancreas 2%
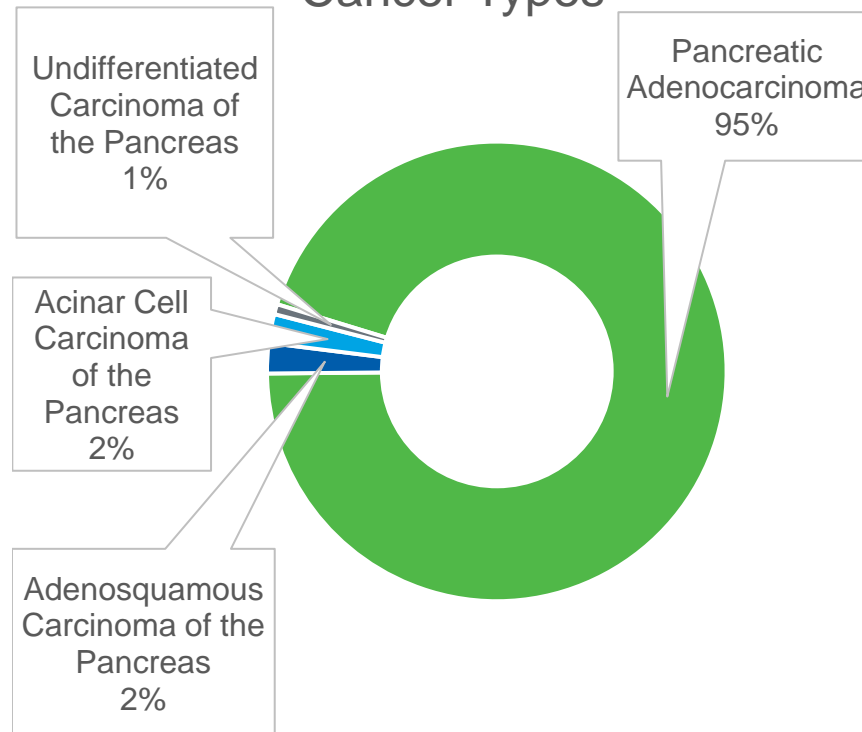
# BPC PANC Demographics



## Age at Diagnosis

(bar chart)
- 18-25: ~1
- 25-35: ~7
- 35-45: ~40
- 45-55: ~140
- 55-65: ~337
- 65-75: ~400
- 75-89: ~177

Y-axis: 0, 50, 100, 150, 200, 250, 300, 350, 400, 450

## Sex

Male 55% | Female 45%

X-axis: 0%, 20%, 40%, 60%, 80%, 100%

## Primary Race

X-axis: 0%, 20%, 40%, 60%, 80%, 100%

Legend:
- White
- Black
- Chinese
- Unknown
- Other Asian
- Other

BPC BPC PANC Cohort: Stage at Diagnosis and Resectability

Stage at Diagnosis

- Stage IV — 44.9%
- Stage II — 40.6%
- Stage III — 9.6%
- Stage I — 4.0%
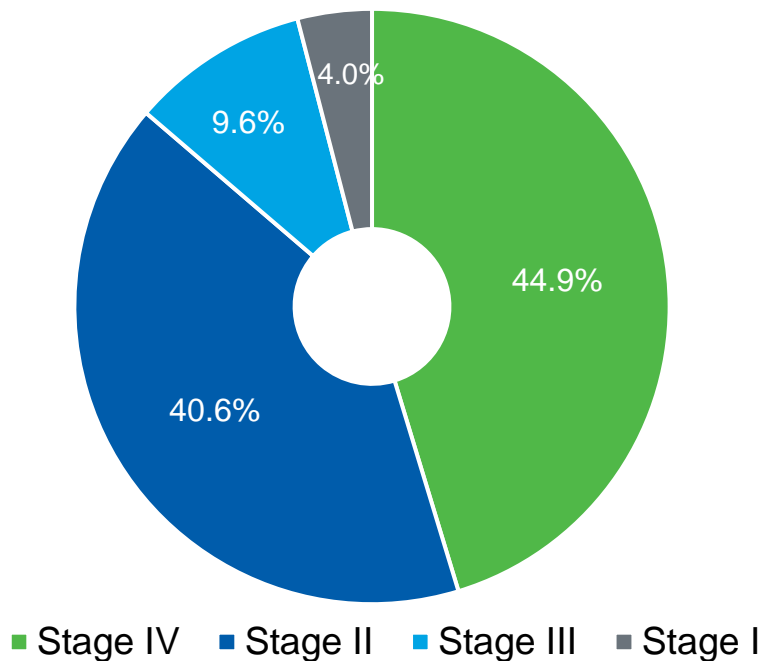
Tumor Resectability Status

- Indeterminate 2%
- Borderline resectable 11%
- Resectable 34%
- Unresectable/locally advanced or metastatic 53%
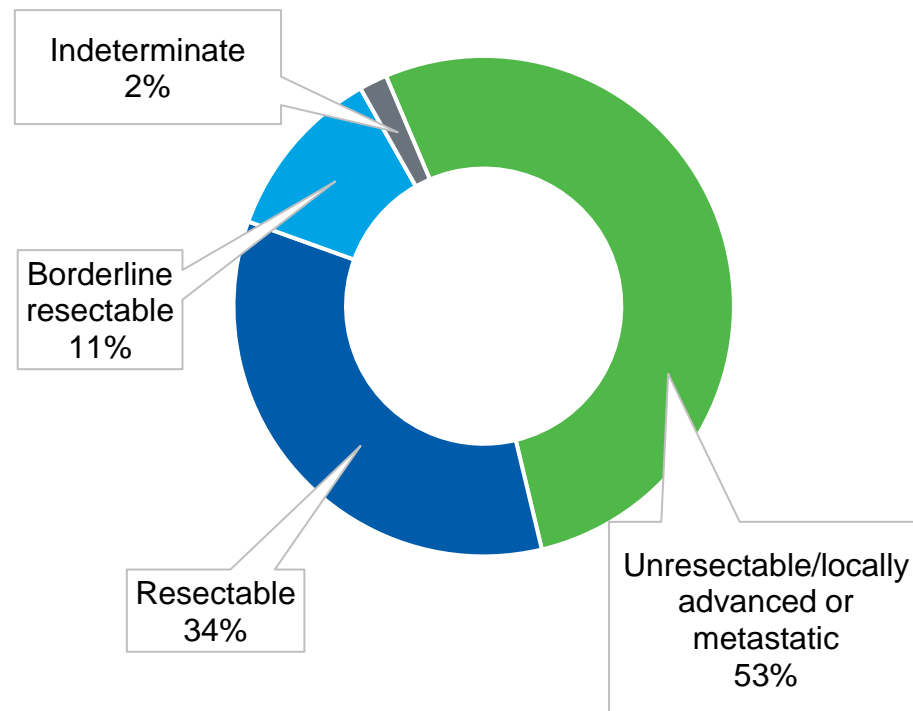
Location of Metastases (Stage IV patients)
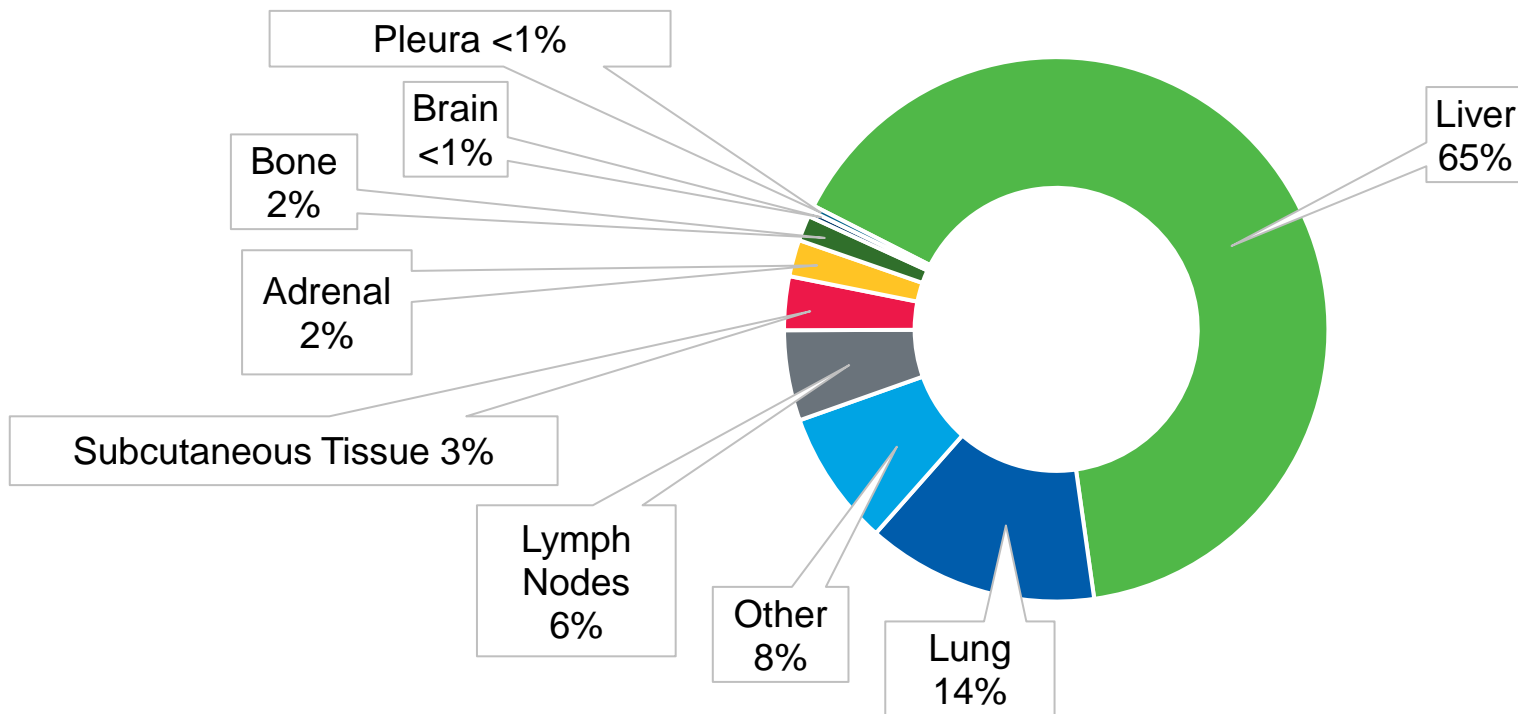
# BPC PANC Cohort:
# Detailed Clinical Genomics

## Mutated Genes

| Gene | # Mut ▼ | # | Freq |
|------|---------|-----|------|
| KRAS | 981 | ☐ 972 | 86.0% |
| TP53 | 796 | ☐ 788 | 69.7% |
| SMAD4 | 240 | ☐ 237 | 21.0% |
| CDKN2A | 174 | ☐ 168 | 14.9% |
| ARID1A | 89 | ☐ 85 | 7.9% |
| KMT2D | 77 | ☐ 73 | 6.8% |
| ATM | 71 | ☐ 61 | 5.4% |
| BRCA2 | 63 | ☐ 54 | 5.0% |
| RNF43 | 58 | ☐ 56 | 6.0% |
| KDM6A | 42 | ☐ 42 | 3.9% |
| ARID1B | 38 | ☐ 36 | 3.4% |
| PIK3CA | 37 | ☐ 36 | 3.2% |
| RECQL4 | 35 | ☐ 33 | 3.3% |
| SMARCA4 | 35 | ☐ 32 | 3.0% |
| KMT2A | 31 | ☐ 29 | 2.7% |
| BRCA1 | 31 | ☐ 30 | 2.8% |

## Structural Variants

| Gene | # SV | # | Freq ▼ |
|------|------|-----|--------|
| CHD4 | 1 | ☐ 1 | 1.8% |
| CDKN2A | 18 | ☐ 18 | 1.7% |
| CCN6 | 1 | ☐ 1 | 1.6% |
| TP53 | 10 | ☐ 10 | 0.9% |
| SMAD4 | 10 | ☐ 10 | 0.9% |
| BRAF | 8 | ☐ 8 | 0.8% |
| NRG1 | 2 | ☐ 2 | 0.7% |
| CD58 | 1 | ☐ 1 | 0.7% |
| KMT2C | 3 | ☐ 3 | 0.5% |
| FUS | 2 | ☐ 2 | 0.5% |
| PRKDC | 2 | ☐ 2 | 0.4% |
| KMT2D | 4 | ☐ 4 | 0.4% |
| SND1 | 4 | ☐ 4 | 0.4% |
| BRCA2 | 4 | ☐ 4 | 0.4% |
| CDKN2B | 4 | ☐ 4 | 0.4% |
| MAP3K14 | 2 | ☐ 2 | 0.4% |

## Copy Number Alterations

| Gene | Cytoband | CNA | # | Freq ▼ |
|------|----------|-----|-----|--------|
| CDKN2A | 9p21.3 | HOMDEL | ☐ 140 | 13.2% |
| CDKN2B | 9p21.3 | HOMDEL | ☐ 131 | 12.4% |
| MTAP | 9p21.3 | HOMDEL | ☐ 29 | 9.9% |
| SMAD4 | 18q21.2 | HOMDEL | ☐ 48 | 4.5% |
| FRS2 | 12q15 | AMP | ☐ 2 | 3.6% |
| MYC | 8q24.21 | AMP | ☐ 31 | 2.9% |
| AKT2 | 19q13.2 | AMP | ☐ 31 | 2.9% |
| TERC | 3q26.2 | AMP | ☐ 4 | 2.2% |
| GATA6 | 18q11.2 | AMP | ☐ 10 | 2.0% |
| ACVR1B | 12q13.13 | HOMDEL | ☐ 1 | 1.8% |
| HSD3B1 | 1p12 | AMP | ☐ 1 | 1.8% |
| SPTA1 | 1q23.1 | AMP | ☐ 1 | 1.8% |
| SLC25A13 | 7q21.3 | AMP | ☐ 5 | 1.7% |
| FGF6 | 12p13.32 | AMP | ☐ 1 | 1.6% |
| FGF10 | 5p12 | AMP | ☐ 1 | 1.6% |
| FGF23 | 12p13.32 | AMP | ☐ 1 | 1.6% |

# Top 12 Mutated Genes BPC PANC Cohort
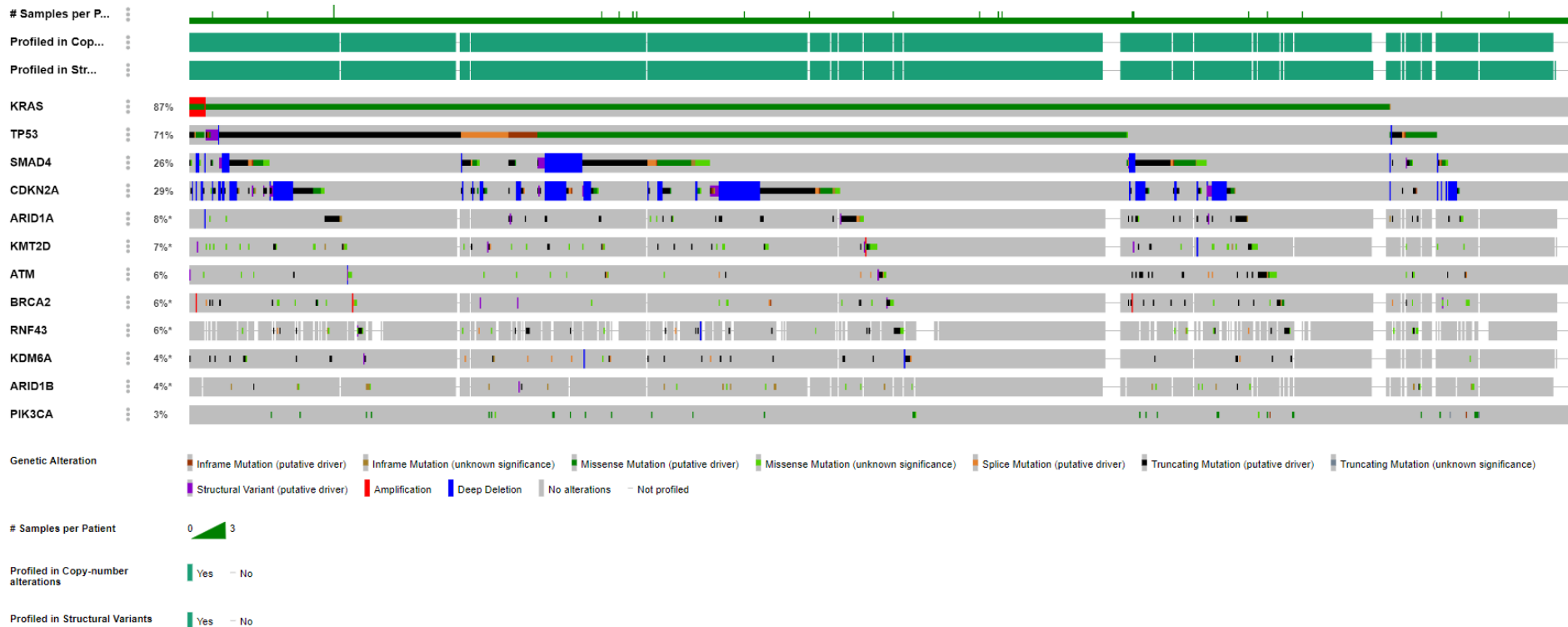
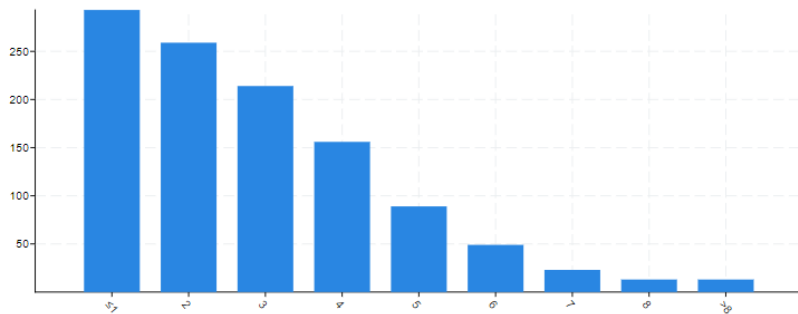# Clinically Actionable Genes BPC PANC Cohort
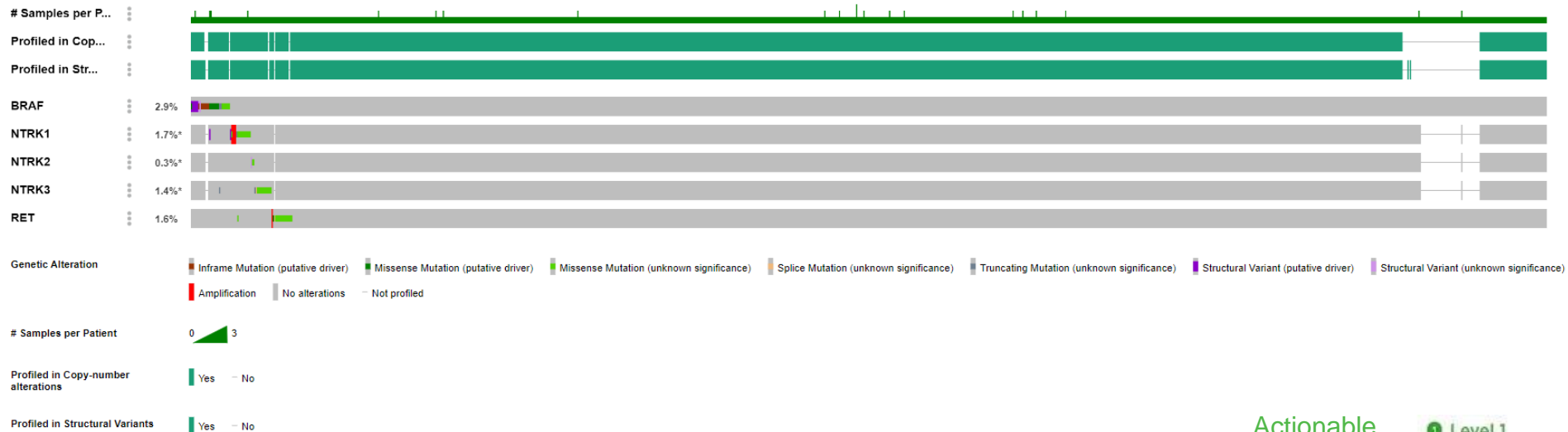


Actionable Genes

Chakravarty et al., JCO PO 2017

Number of cancer-directed drug regimens curated for each patient



### Cancer-directed Drug Regimens (Includes regimens ever received for PANC irrespective of line or stage)

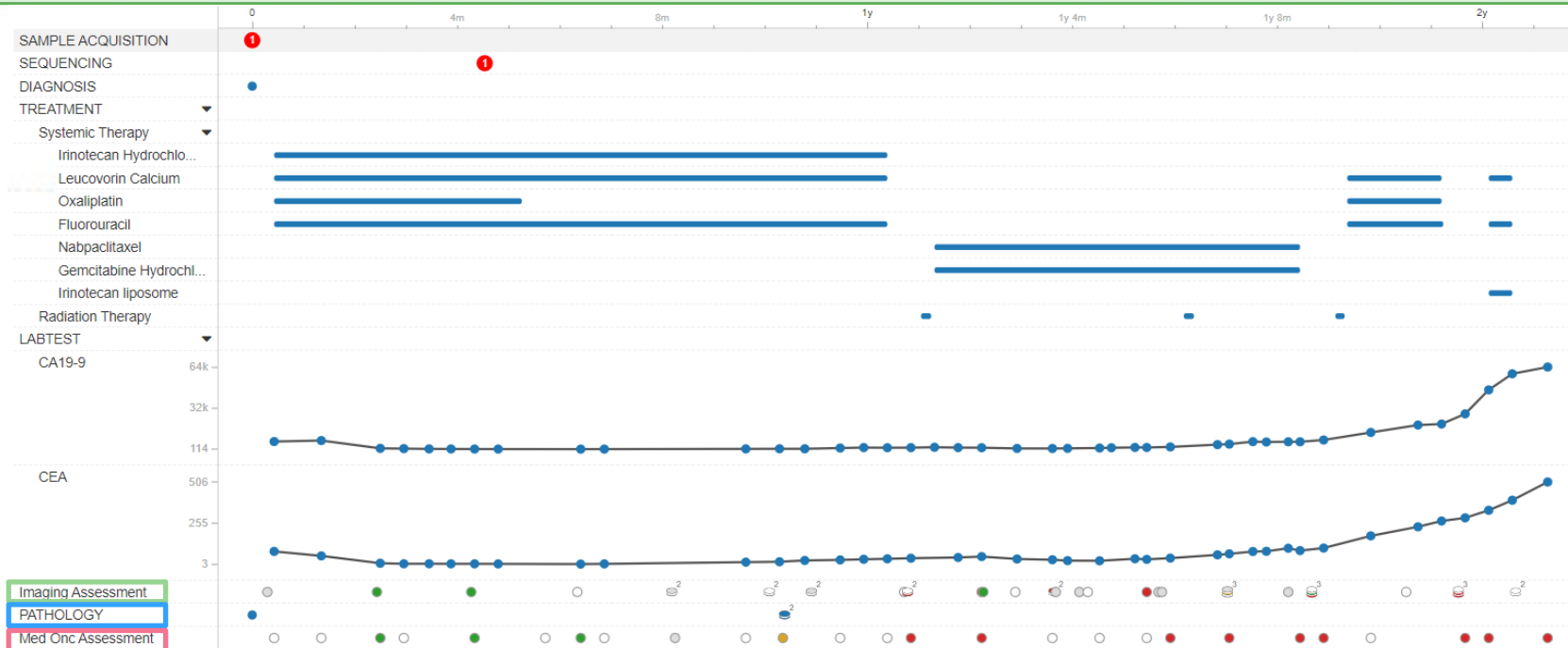| Regimen | # of patients |
|---------|---------------|
| FULV (Fluorouracil & LeucoVorin) | 777 |
| Gemcitabine + Radiation Therapy | 309 |
| Fluorouracil + Radiation Therapy | 290 |
| GemCap (Gemcitabine & Capecitabine) | 270 |

### Treatments by Patient

| Treatment | | # ▼ |
|-----------|--|-----|
| Gemcitabine Hydrochloride | ☐ | 851 |
| Fluorouracil | ☐ | 800 |
| Leucovorin Calcium | ☐ | 780 |
| Oxaliplatin | ☐ | 752 |
| Irinotecan Hydrochloride | ☐ | 678 |
| Nabpaclitaxel | ☐ | 629 |
| Capecitabine | ☐ | 298 |
| Investigational Drug | ☐ | 197 |
| Irinotecan liposome | ☐ | 110 |
| Cisplatin | ☐ | 65 |
| Olaparib | ☐ | 22 |
| Pembrolizumab | ☐ | 15 |
| Carboplatin | ☐ | 11 |
| Nivolumab | ☐ | 9 |

### Treatments by Sample (pre- and post-)

| Treatment | Pre / Post | | # ▼ |
|-----------|------------|--|-----|
| Gemcitabine Hydrochloride | Pre | ☐ | 753 |
| Gemcitabine Hydrochloride | Post | ☐ | 119 |
| Fluorouracil | Pre | ☐ | 652 |
| Fluorouracil | Post | ☐ | 168 |
| Leucovorin Calcium | Pre | ☐ | 633 |
| Leucovorin Calcium | Post | ☐ | 166 |
| Oxaliplatin | Pre | ☐ | 602 |
| Oxaliplatin | Post | ☐ | 168 |
| Nabpaclitaxel | Pre | ☐ | 572 |
| Nabpaclitaxel | Post | ☐ | 70 |
| Irinotecan Hydrochloride | Pre | ☐ | 535 |
| Irinotecan Hydrochloride | Post | ☐ | 159 |
| Capecitabine | Pre | ☐ | 268 |
| Capecitabine | Post | ☐ | 42 |

# Longitudinal Data Collection
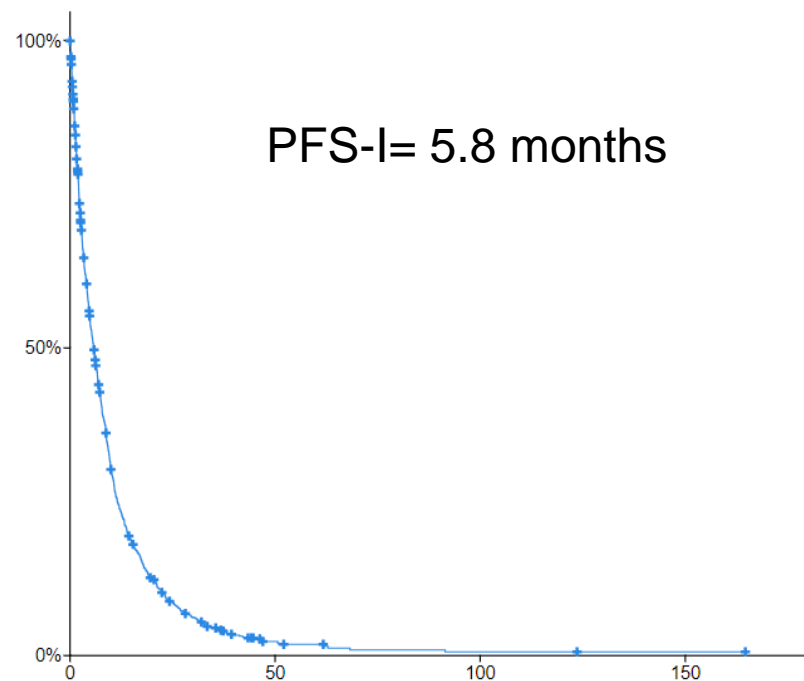


Sample Patient
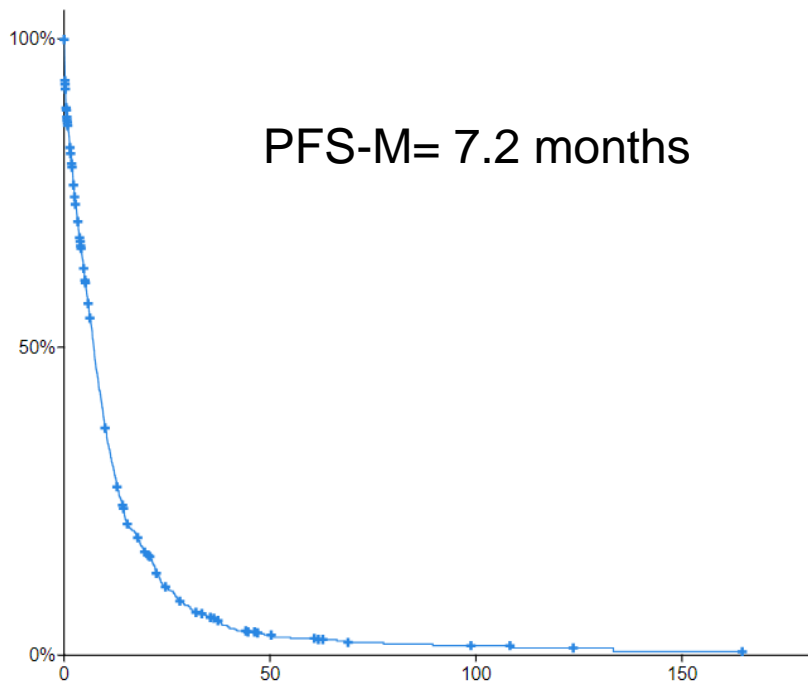
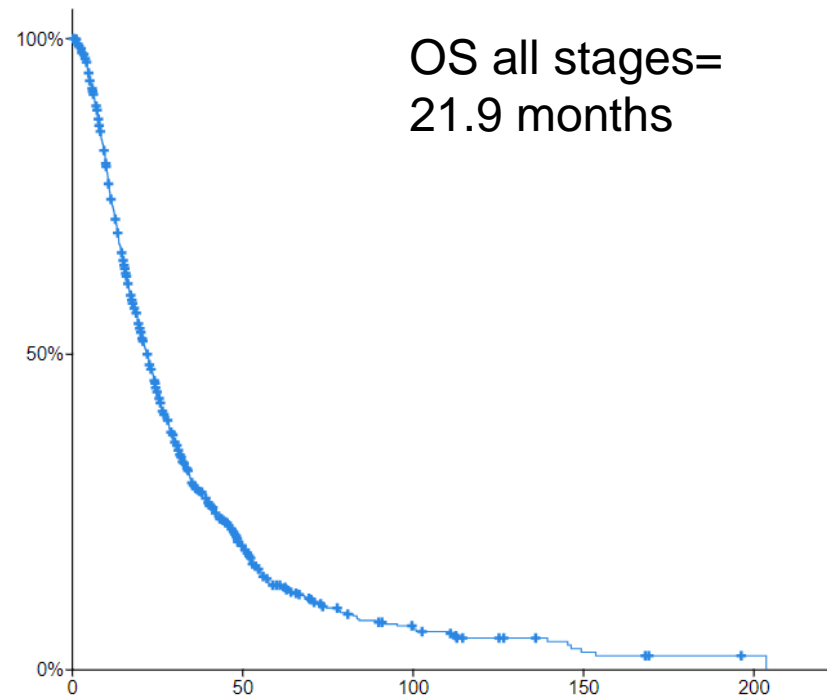Disease Status by Medical Oncology Note    Disease Status by Imaging    Pathology Reports

# BPC PANC Cohort:
# High Quality Clinical Data



PFS-M= 7.2 months

PFS-I= 5.8 months

* Not adjusted for delayed entry

- PFS-M and PSF-I are available by regimen for those regimens containing greater than 10 patients

OS all stages= 21.9 months
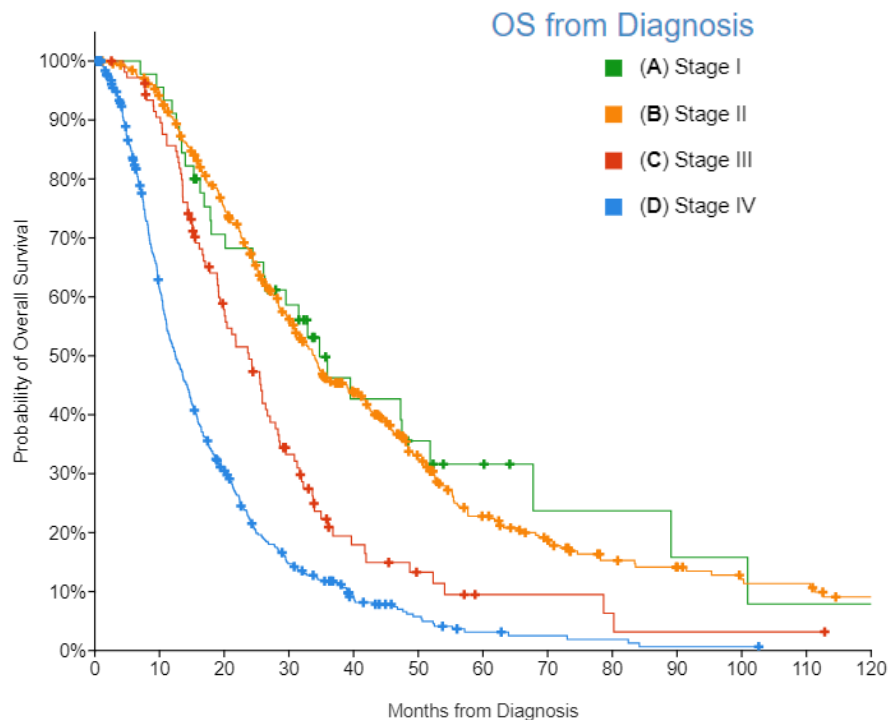
* Not adjusted for delayed entry

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