To estimate the **Potential Peak Sales** for olaparib (Lynparza) in the indication of BRCA-mutated (BRCAm) metastatic castration-resistant prostate cancer (mCRPC) in the US, EU5 (Germany, France, Italy, Spain, UK), China, and Japan, as well as the **$ value of a 1% share of treated patients** in these geographies, we need to follow a structured approach. Since specific data (e.g., exact patient numbers, pricing, or market penetration rates) are not provided, I will outline the methodology using reasonable assumptions based on publicly available data, oncology market trends, and standard industry practices. The final numbers are illustrative and should be validated with precise market data.

Step 1: Define Key Parameters

1. **Target Patient Population**: Estimate the number of eligible patients with BRCAm mCRPC in each geography.

2. **Treatment Rate**: Assume a percentage of eligible patients who are treated (given the 20%-30% share of treated patients).

3. **Drug Pricing**: Estimate the annual cost of olaparib per patient in each region (prices vary by geography due to healthcare systems and negotiations).

4. **Market Share**: Use the provided 20%-30% share of treated patients as the basis for peak sales.

5. **Peak Sales Calculation**: Multiply the number of treated patients by the annual cost per patient.

6. **1% Share Value**: Calculate the value of 1% of treated patients by dividing the total sales by the market share percentage.

Step 2: Estimate Patient Population for BRCAm mCRPC

- **Prevalence of mCRPC**: Metastatic castration-resistant prostate cancer (mCRPC) represents a subset of prostate cancer patients. Approximately 10-20% of prostate cancer patients progress to mCRPC.

- **BRCA Mutation Rate**: Around 10-12% of mCRPC patients have BRCA1/2 mutations (based on studies like the PROfound trial, which supported olaparib's approval).

- **Total Population and Incidence**: Use prostate cancer incidence rates and population data for each geography to estimate the mCRPC BRCAm population.

Estimated Eligible Patients (Illustrative Numbers):

- **US**: Prostate cancer incidence ~248,000 annually (ACS 2023). ~15% progress to mCRPC (~37,200), and ~12% have BRCAm (~4,500 patients).

- **EU5**: Combined prostate cancer incidence ~400,000 annually (ECIS). ~15% mCRPC (~60,000), ~12% BRCAm (~7,200 patients).

- **China**: Prostate cancer incidence ~115,000 annually (GLOBOCAN). ~15% mCRPC (~17,250), ~12% BRCAm (~2,070 patients).

- **Japan**: Prostate cancer incidence ~92,000 annually (GLOBOCAN). ~15% mCRPC (~13,800), ~12% BRCAm (~1,650 patients).

Total eligible patients (BRCAm mCRPC):

- US: ~4,500

- EU5: ~7,200

- China: ~2,070

- Japan: ~1,650

Total across geographies: ~15,420 patients.

Step 3: Estimate Annual Treatment Cost of Olaparib

Olaparib pricing varies by region due to differences in healthcare systems and reimbursement:

- **US**: ~$150,000 per year (based on list prices for PARP inhibitors like Lynparza in oncology indications).

- **EU5**: ~$80,000-$100,000 per year (lower due to price negotiations and universal healthcare systems; assume $90,000).

- **China**: ~$50,000 per year (lower pricing due to market access programs and negotiations).

- **Japan**: ~$100,000 per year (similar to EU due to regulated pricing).

Step 4: Estimate Treated Patients with 20%-30% Market Share

Assume not all eligible patients are treated (due to access, diagnosis rates, or physician preference). Let's assume a **treatment rate of 80%** of eligible patients (illustrative), and olaparib captures 20%-30% of those treated patients.

Treated Patients (80% of eligible):

- US: 4,500 * 80% = 3,600

- EU5: 7,200 * 80% = 5,760

- China: 2,070 * 80% = 1,656

- Japan: 1,650 * 80% = 1,320

Olaparib's Share (20%-30% of treated):

- **20% Share**:

- US: 3,600 * 20% = 720 patients

- EU5: 5,760 * 20% = 1,152 patients

- China: 1,656 * 20% = 331 patients

- Japan: 1,320 * 20% = 264 patients

- **30% Share**:

- US: 3,600 * 30% = 1,080 patients

- EU5: 5,760 * 30% = 1,728 patients

- China: 1,656 * 30% = 497 patients

- Japan: 1,320 * 30% = 396 patients

Step 5: Calculate Potential Peak Sales

Peak sales = (Number of patients treated with olaparib) * (Annual cost per patient)

At 20% Market Share:

- US: 720 patients * $150,000 = **$108 million**
- EU5: 1,152 patients * $90,000 = **$103.7 million**
- China: 331 patients * $50,000 = **$16.6 million**
- Japan: 264 patients * $100,000 = **$26.4 million**
- **Total Peak Sales (20%)**: $108M + $103.7M + $16.6M + $26.4M = **$254.7 million**

At 30% Market Share:

- US: 1,080 patients * $150,000 = **$162 million**
- EU5: 1,728 patients * $90,000 = **$155.5 million**
- China: 497 patients * $50,000 = **$24.9 million**
- Japan: 396 patients * $100,000 = **$39.6 million**
- **Total Peak Sales (30%)**: $162M + $155.5M + $24.9M + $39.6M = **$382 million**

Step 6: Calculate $ Value of 1% Share of Treated Patients

1% share of treated patients corresponds to 1% of the total treated patients in each geography. Value of 1% share = (Total treated patients * 1%) * (Annual cost per patient).

Total Treated Patients (from Step 4):

- US: 3,600
- EU5: 5,760
- China: 1,656
- Japan: 1,320

Value of 1% Share:

- US: (3,600 * 1%) * $150,000 = 36 patients * $150,000 = **$5.4 million**
- EU5: (5,760 * 1%) * $90,000 = 57.6 patients * $90,000 = **$5.2 million**
- China: (1,656 * 1%) * $50,000 = 16.56 patients * $50,000 = **$0.83 million**
- Japan: (1,320 * 1%) * $100,000 = 13.2 patients * $100,000 = **$1.32 million**
- **Total Value of 1% Share**: $5.4M + $5.2M + $0.83M + $1.32M = **$12.75 million**

Final Answer

- **Potential Peak Sales for Olaparib in BRCAm mCRPC (20%-30% Market Share)**:

- At 20% share: **$254.7 million**

- At 30% share: **$382 million**

- **$ Value of 1% Share of Treated Patients** across US, EU5, China, and Japan: **$12.75 million**

Notes and Caveats

1. These estimates are based on illustrative assumptions for patient numbers, treatment rates, market share, and pricing. Actual numbers may differ due to real-world data on diagnosis rates, access to companion diagnostics, reimbursement, and competition (e.g., other PARP inhibitors or therapies for mCRPC).

2. Peak sales may take several years to achieve post-approval (e.g., 5-7 years) and depend on market penetration and adoption.

3. Pricing is subject to change due to negotiations, generic competition (if applicable), or health technology assessments (HTAs) in regions like the EU5.

4. For precise estimates, consult epidemiology data, payer reports, or commercial forecasts from sources like EvaluatePharma, GlobalData, or company filings.

If you have specific data (e.g., exact patient numbers or pricing), I can refine the calculations accordingly.