

To estimate the **Potential Peak Sales** for abemaciclib (Verzenio) in the adjuvant treatment of HR-positive, HER2-negative, node-positive, early breast cancer at high risk of recurrence 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 exact data on patient numbers, pricing, and penetration rates may not be publicly available, I will outline the methodology and make reasonable assumptions based on available market data and trends. This will provide an illustrative estimate.

Step 1: Define the Target Patient Population

- **Indication:** Adjuvant treatment of HR-positive, HER2-negative, node-positive, early breast cancer at high risk of recurrence.

- **Epidemiology:**

- Breast cancer is the most common cancer globally, with HR-positive, HER2-negative subtype representing ~60-70% of cases.

- Early breast cancer (stages I-III) accounts for ~90% of diagnosed cases, and node-positive patients with high risk of recurrence are a subset of this group (estimated at ~20-30% of early breast cancer cases).

- Using breast cancer incidence data and refining it for this specific indication, we can estimate the eligible patient population.

Estimated Annual Incidence of Breast Cancer (2023, approximate figures):

- US: ~290,000 new cases

- EU5: ~260,000 new cases (combined)

- China: ~420,000 new cases

- Japan: ~95,000 new cases

Refining for Target Population (assumptions):

- HR-positive, HER2-negative: 65% of total cases.

- Early breast cancer: 90% of total cases.

- Node-positive, high risk of recurrence: 25% of early breast cancer cases.

- Therefore, target population = Total incidence \times 0.65 \times 0.9 \times 0.25.

Calculated Target Population (Annual New Cases):

- US: $290,000 \times 0.65 \times 0.9 \times 0.25 = \sim 42,400$ patients

- EU5: $260,000 \times 0.65 \times 0.9 \times 0.25 = \sim 38,000$ patients

- China: $420,000 \times 0.65 \times 0.9 \times 0.25 = \sim 61,400$ patients

- Japan: $95,000 \times 0.65 \times 0.9 \times 0.25 = \sim 13,900$ patients

- **Total Target Population:** ~155,700 patients annually across these geographies.

Step 2: Estimate Treated Patient Share

- The problem assumes a **20% to 30% share of treated patients** for abemaciclib in this indication.
- This share accounts for market penetration, competition (e.g., other CDK4/6 inhibitors like palbociclib and ribociclib), physician adoption, and patient access.
- For peak sales calculation, we will use the midpoint of **25% share**.

Treated Patients with Abemaciclib (25% share):

- US: $42,400 \times 0.25 = \sim 10,600$ patients
- EU5: $38,000 \times 0.25 = \sim 9,500$ patients
- China: $61,400 \times 0.25 = \sim 15,350$ patients
- Japan: $13,900 \times 0.25 = \sim 3,475$ patients
- **Total Treated Patients:** $\sim 38,925$ patients annually.

Step 3: Estimate Annual Treatment Cost per Patient

- Abemaciclib is a premium-priced drug as a CDK4/6 inhibitor.
- **US Pricing:** $\sim \$12,000$ – $\$15,000$ per month (based on metastatic breast cancer pricing). For adjuvant therapy (typically 2 years), annual cost $\sim \$144,000$ – $\$180,000$. Assume $\$160,000$ per year.
- **EU5 Pricing:** Typically 40-60% lower than US due to price controls. Assume $\sim \$80,000$ per year.
- **Japan Pricing:** Similar to EU5, assume $\sim \$80,000$ per year.
- **China Pricing:** Significantly lower due to market access negotiations and generics pressure. Assume $\sim \$30,000$ per year.

Note: Adjuvant therapy duration is often shorter (e.g., 2 years for abemaciclib per clinical trials like monarchE). For simplicity, we calculate annual cost and assume peak sales reflect annualized revenue at steady state (patients on therapy in a given year).

Step 4: Calculate Potential Peak Sales

Peak Sales = Treated Patients \times Annual Cost per Patient

- **US:** $10,600 \text{ patients} \times \$160,000 = \sim \$1.70 \text{ billion}$
- **EU5:** $9,500 \text{ patients} \times \$80,000 = \sim \$0.76 \text{ billion}$
- **China:** $15,350 \text{ patients} \times \$30,000 = \sim \$0.46 \text{ billion}$

- **Japan:** $3,475 \text{ patients} \times \$80,000 = \sim\$0.28 \text{ billion}$
- **Total Peak Sales:** $\$1.70\text{B} + \$0.76\text{B} + \$0.46\text{B} + \$0.28\text{B} = \sim\$3.20 \text{ billion annually}$

Range for Peak Sales (based on 20-30% share):

- At 20% share: $\sim\$2.56 \text{ billion}$
- At 30% share: $\sim\$3.84 \text{ billion}$

Thus, **Potential Peak Sales** for abemaciclib in this indication across the specified geographies is approximately **\$2.56B to \$3.84B**, with a midpoint of **\$3.20B**.

Step 5: Calculate \$ Value of 1% Share of Treated Patients

1% of Treated Patients = 1% of Total Target Population \times Annual Cost per Patient

- **US:** $42,400 \times 0.01 = 424 \text{ patients} \times \$160,000 = \sim\$67.8 \text{ million}$
- **EU5:** $38,000 \times 0.01 = 380 \text{ patients} \times \$80,000 = \sim\$30.4 \text{ million}$
- **China:** $61,400 \times 0.01 = 614 \text{ patients} \times \$30,000 = \sim\$18.4 \text{ million}$
- **Japan:** $13,900 \times 0.01 = 139 \text{ patients} \times \$80,000 = \sim\$11.1 \text{ million}$
- **Total Value of 1% Share:** $\$67.8\text{M} + \$30.4\text{M} + \$18.4\text{M} + \$11.1\text{M} = \sim\$127.7 \text{ million}$

Thus, the **\$ value of a 1% share of treated patients** across these geographies is approximately **\$127.7 million**.

Summary of Results

1. Potential Peak Sales for Abemaciclib (20-30% share):

- US: $\$1.36\text{B}$ to $\$2.04\text{B}$ (midpoint $\$1.70\text{B}$)
- EU5: $\$0.61\text{B}$ to $\$0.91\text{B}$ (midpoint $\$0.76\text{B}$)
- China: $\$0.37\text{B}$ to $\$0.55\text{B}$ (midpoint $\$0.46\text{B}$)
- Japan: $\$0.22\text{B}$ to $\$0.33\text{B}$ (midpoint $\$0.28\text{B}$)
- **Total:** **$\$2.56\text{B}$ to $\$3.84\text{B}$** (midpoint $\$3.20\text{B}$)

2. \$ Value of 1% Share of Treated Patients:

- US: $\$67.8\text{M}$
- EU5: $\$30.4\text{M}$
- China: $\$18.4\text{M}$

- Japan: \$11.1M

- **Total: \$127.7M**

Caveats and Assumptions

- **Epidemiology:** Patient population estimates are based on approximate incidence rates and subtype distributions. Real-world data may vary.

- **Pricing:** Costs are assumed based on public data for metastatic indications and adjusted for adjuvant use and regional pricing differences. Actual negotiated prices may differ.

- **Market Share:** The 20-30% range is as per the query, but competition and access barriers (e.g., reimbursement in China) may impact penetration.

- **Treatment Duration:** Peak sales assume annualized revenue; actual sales may depend on the number of patients completing the 2-year adjuvant therapy.

These estimates are illustrative and should be validated with primary market research or company-provided guidance for more precision. If you have additional data (e.g., exact pricing or patient numbers), I can refine the calculations further.