To estimate the **Potential Peak Sales** for selumetinib (KOSELUGO) in the indication of neurofibromatosis type 1 (NF1) with symptomatic, inoperable plexiform neurofibromas (PN) in pediatric patients across 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 on patient population, pricing, and market penetration may not be fully available, I will make reasonable assumptions based on publicly available information, rare disease market dynamics, and typical pricing for orphan drugs. Let's break this down step by step.

Step 1: Define the Target Patient Population

Selumetinib is approved for pediatric patients (2 years and older) with NF1 who have symptomatic, inoperable plexiform neurofibromas (PN). NF1 is a rare genetic disorder with a prevalence of approximately 1 in 3,000 to 4,000 individuals worldwide. Plexiform neurofibromas occur in about 20-50% of NF1 patients, and a subset of these are symptomatic and inoperable.

- **Prevalence of NF1**: ~1 in 3,500 (average).

- **Proportion with PN**: ~30% of NF1 patients.

- **Proportion with symptomatic, inoperable PN**: Estimated at ~50% of PN cases, or ~15% of total NF1 patients.

- **Pediatric focus**: Approximately 50% of NF1 cases are diagnosed in childhood, so we focus on the pediatric population (ages 2-18).

Population Estimates (Pediatric NF1 with Symptomatic, Inoperable PN):

1. **US**: Population ~330M; pediatric (~20%) ~66M; NF1 prevalence ~18,850 pediatric cases; ~15% with symptomatic, inoperable PN = ~2,830 patients.

2. **EU5**: Population ~330M; pediatric (~20%) ~66M; NF1 prevalence ~18,850 pediatric cases; ~15% with symptomatic, inoperable PN = ~2,830 patients.

3. **China**: Population ~1,400M; pediatric (~20%) ~280M; NF1 prevalence ~80,000 pediatric cases; ~15% with symptomatic, inoperable PN = ~12,000 patients.

4. **Japan**: Population ~125M; pediatric (~20%) ~25M; NF1 prevalence ~7,150 pediatric cases; ~15% with symptomatic, inoperable PN = ~1,070 patients.

Total Target Patient Population Across Geographies: ~2,830 (US) + 2,830 (EU5) + 12,000 (China) + 1,070 (Japan) = ~18,730 patients.

Step 2: Estimate Treated Patient Share

The query assumes a **20% to 30% share of treated patients**. This accounts for factors such as diagnosis rates, access to treatment, physician adoption, and payer reimbursement in rare disease settings.

- **Treated Patients (20% share)**: 18,730 * 0.2 = ~3,746 patients.

- **Treated Patients (30% share)**: 18,730 * 0.3 = ~5,619 patients.

Step 3: Estimate Annual Cost of Therapy

Selumetinib is an orphan drug for a rare disease, and pricing for such therapies is typically high. Based on reports and typical pricing for rare disease drugs:

- **US Annual Cost**: ~$150,000 per patient (based on pricing trends for oral kinase inhibitors in rare diseases).

- **EU5 Annual Cost**: ~$120,000 per patient (typically lower due to pricing negotiations and health system discounts).

- **China Annual Cost**: ~$50,000 per patient (lower pricing due to market access challenges and affordability constraints).

- **Japan Annual Cost**: ~$130,000 per patient (similar to US/EU due to advanced healthcare system).

Step 4: Calculate Potential Peak Sales

Peak sales are calculated as the number of treated patients multiplied by the annual cost of therapy in each geography.

At 20% Treated Patient Share:

- **US**: 2,830 * 0.2 * $150,000 = ~$84.9M.

- **EU5**: 2,830 * 0.2 * $120,000 = ~$67.9M.

- **China**: 12,000 * 0.2 * $50,000 = ~$120M.

- **Japan**: 1,070 * 0.2 * $130,000 = ~$27.8M.

- **Total Peak Sales (20%)**: $84.9M + $67.9M + $120M + $27.8M = ~**$300.6M**.

At 30% Treated Patient Share:

- **US**: 2,830 * 0.3 * $150,000 = ~$127.4M.

- **EU5**: 2,830 * 0.3 * $120,000 = ~$101.9M.

- **China**: 12,000 * 0.3 * $50,000 = ~$180M.

- **Japan**: 1,070 * 0.3 * $130,000 = ~$41.7M.

- **Total Peak Sales (30%)**: $127.4M + $101.9M + $180M + $41.7M = ~**$451M**.

Potential Peak Sales Range: **$300.6M to $451M** annually across the US, EU5, China, and Japan.

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

A 1% share of treated patients corresponds to 1% of the total target patient population being treated with selumetinib.

- **Total Target Patients**: 18,730.

- **1% of Target Patients**: 18,730 * 0.01 = ~187 patients.

Now calculate the revenue from these 187 patients using the same annual cost per geography (weighted by patient distribution):

- **US**: (2,830 / 18,730) * 187 * $150,000 = ~$4.24M.

- **EU5**: (2,830 / 18,730) * 187 * $120,000 = ~$3.39M.

- **China**: (12,000 / 18,730) * 187 * $50,000 = ~$6.0M.

- **Japan**: (1,070 / 18,730) * 187 * $130,000 = ~$1.39M.

- **Total $ Value of 1% Share**: $4.24M + $3.39M + $6.0M + $1.39M = ~**$15.02M**.

$ Value of 1% Share of Treated Patients: ~**$15.0M** annually.

Final Answer:

1. **Potential Peak Sales for Selumetinib** in the indication of NF1 with symptomatic, inoperable PN (pediatric patients) across the US, EU5, China, and Japan:

- At 20% treated patient share: ~**$300.6M** annually.

- At 30% treated patient share: ~**$451M** annually.

- **Range**: **$300M to $451M** annually.

2. **$ Value of 1% Share of Treated Patients** across these geographies: ~**$15.0M** annually.

Notes and Assumptions:

- Patient population estimates are based on general prevalence data for NF1 and assumptions about the proportion with symptomatic, inoperable PN in the pediatric population.

- Pricing is assumed based on typical orphan drug costs and regional pricing differences. Actual pricing may vary.

- Market penetration (20-30%) is assumed as per the query, though real-world adoption may depend on reimbursement, awareness, and competition.

- These figures are rough estimates and should be validated with more specific epidemiological data, real-world pricing, and market access information if available.