

Cost of Anti-CD38 Monoclonal Antibodies in Combination with Carfilzomib and Dexamethasone for Relapsed Refractory Multiple Myeloma

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Background

- Multiple myeloma (MM) is a rare hematological malignancy, primarily affecting patients ≥65 years old and accounting for approximately 1.8% of all new cancer cases.¹
- Although survival outcomes of patients with MM has increased in recent years (5-year relative survival 59.8% during 2013–2019,¹ i.e., patients with MM are, on average, 59.8% as likely as people with no MM to live for at least 5 years after being diagnosed), most patients with MM experience relapse after first-line treatment, which is associated with increase in the economic burden of managing MM.^{2,3}
- The use of anti-CD38 monoclonal antibodies, including isatuximab (Isa) and daratumumab (Dara), in combination with carfilzomib (K) and dexamethasone (d), has provided important treatment options for patients with relapsed refractory multiple myeloma (RRMM) who have received 1–3 prior lines of therapy. IsaKd and DaraKd have demonstrated significant improvement in progression-free survival (PFS) over Kd (median PFS: 41.7 vs 20.8 months and 28.4 vs 15.2 months, respectively, both $p < 0.001$) with manageable safety profile.^{4,5}
- The median duration of Dara regimen ranged from 6.5 to 9.8 months, shorter than median drug exposure reported in clinical trials.^{6,7}
- Previous studies have documented substantial costs for patients with MM receiving second or subsequent lines of treatment.^{2,3,8,9} Information on costs of anti-CD38 regimens can provide a benchmark for evaluating emerging treatments from a US payer's perspective.

Objective

- This study assesses the total regimen costs of IsaKd and DaraKd in the first year of treatment from a US payer's perspective.

Methods

- A cost calculator was developed to estimate the total regimen cost of adding an anti-CD38 agent (Isa or Dara) in combination with Kd from a US health plan perspective over a one-year period for eligible adults who have received at least one prior therapy for MM.
- The model considered once-weekly and twice-weekly dosing schedules for K, Isa intravenous (IV), DaraIV and Dara subcutaneous (DaraSC for Dara and hyaluronidase-fihj) formulations.
- The Average Sale Price (ASP) and Wholesaler Acquisition Cost (WAC) were used to calculate the first-year total regimen costs (Table 1).

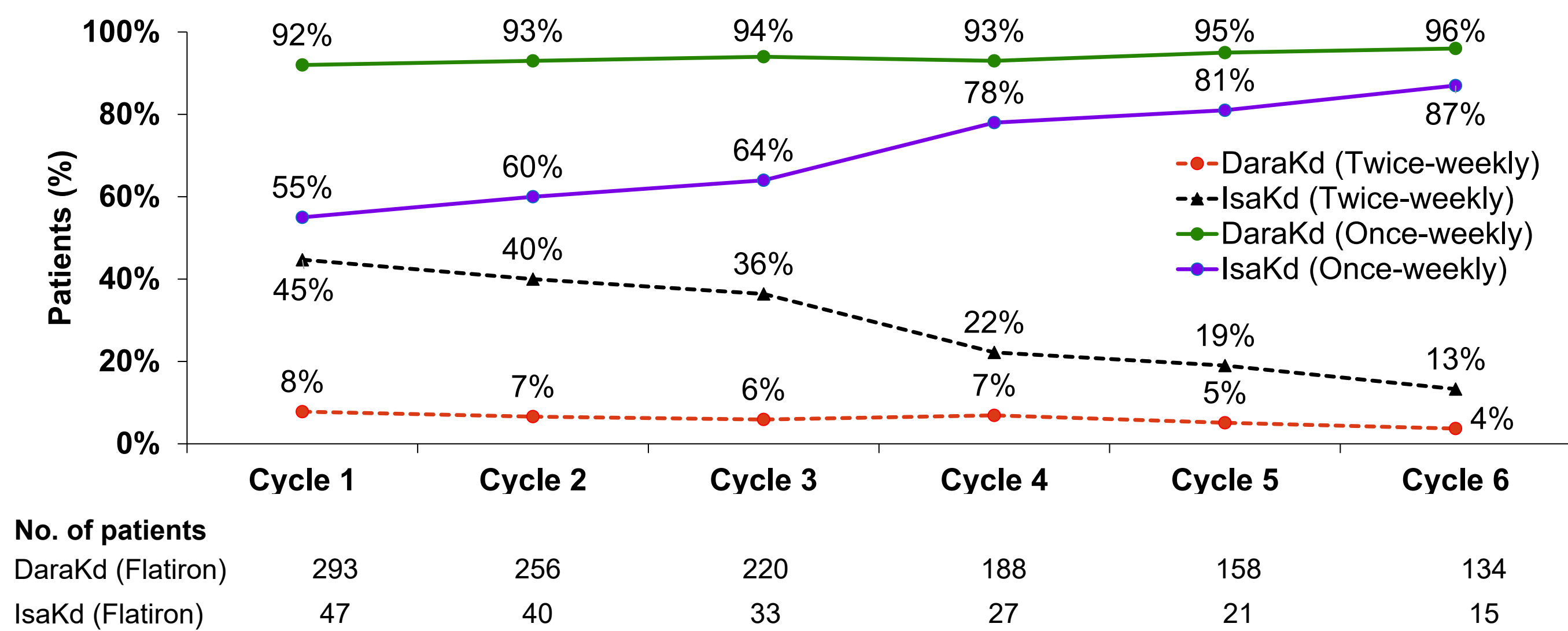
Table 1: Drug Acquisition Costs by ASP and WAC

Drug	Unit strength	ASP (per mg)	WAC (per mg)
Isa	100 mg per vial	\$7.01	\$7.53
Dara (IV)	100 mg per vial	\$5.83	\$6.69
Dara (SC)	1,800 mg per vial	\$4.63	\$5.07
K	30 mg per vial	\$44.38	\$49.65
d	4 mg per tablet	-	\$0.25

Note: Prices based on Q3, 2023 ASP and WAC. ASP with 2-quarters lag. ASP, Average Sales Price; d, dexamethasone; Dara, daratumumab; Isa, isatuximab; IV, intravenous; K, carfilzomib; Q3, quarter three; SC, subcutaneous; WAC, Wholesaler Acquisition Cost; \$, US Dollar.

- Key assumptions and inputs used in the analysis included the following:
 - All analyses were based on an average patient with RRMM with weight of 80 kg and body surface area of 1.86 m².
 - IsaKd and DaraKd (IV and SC) were administered in 28-day cycles. No vial sharing was considered in the analyses.
 - In the base case scenario, first-year total regimen cost (13 cycles) of IsaKd and DaraKd was estimated, using drug unit costs and dosing schedules per label.
 - In scenarios analysis, real-world utilization of K (once-weekly and twice-weekly dosing) was applied (Figure 1) using information from patients with MM in Flatiron Electronic Health Record (EHR)-derived database who received their first anti-CD38 therapy between Jan 1, 2011–Aug 31, 2023.¹⁰

Figure 1. Once- and Twice-weekly K Use in Patients Receiving IsaKd and DaraKd Regimens



Note: Based on data analysis of patients with MM in the Flatiron database who received their first anti-CD38 therapy between Jan 1, 2011–Aug 31, 2023. d, dexamethasone; Dara, daratumumab; Isa, isatuximab; K, carfilzomib; MM, multiple myeloma.

Results

The first-year regimen costs of IsaKd, DaraIV-Kd, and DaraSC-Kd as per label dosing are presented in Table 2 and Figures 2a-2b and 3a-3b.

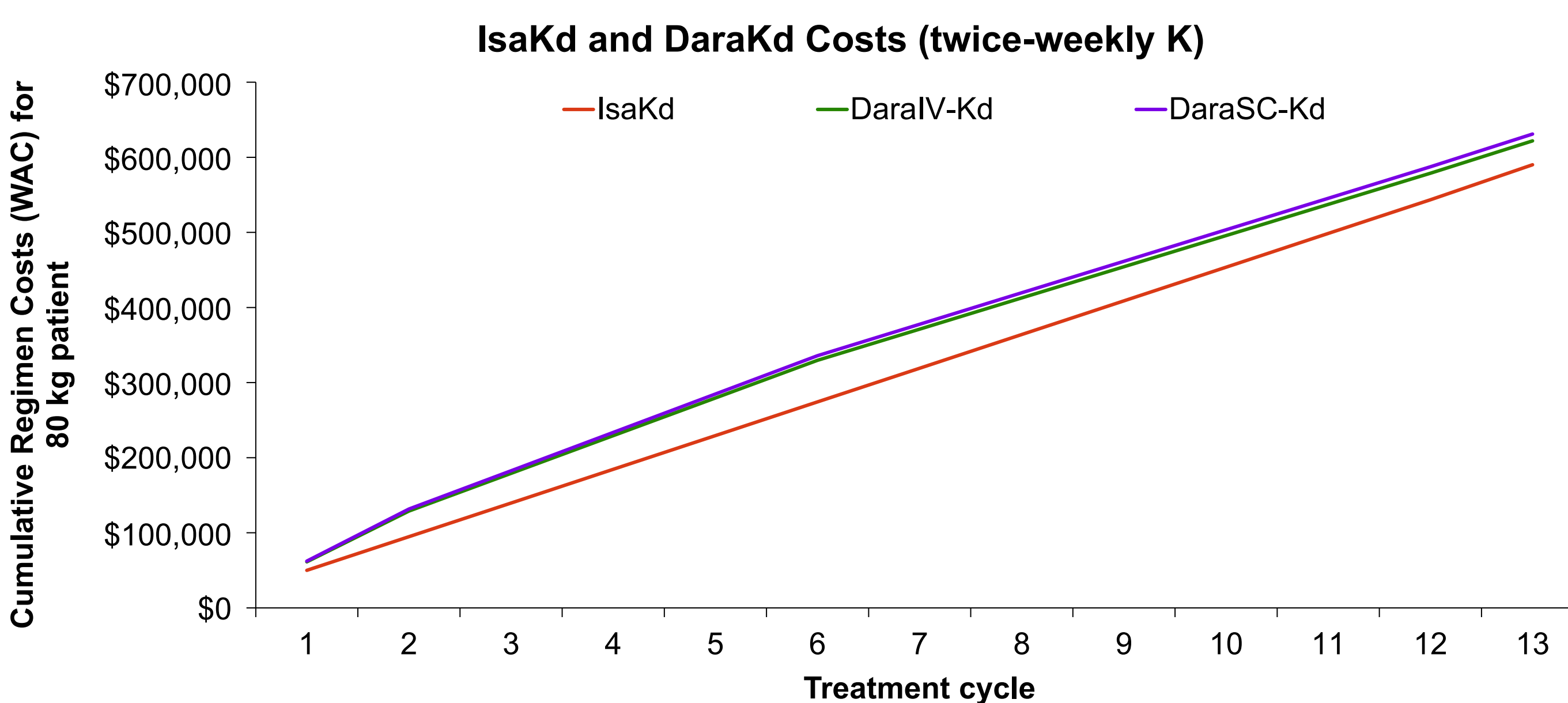
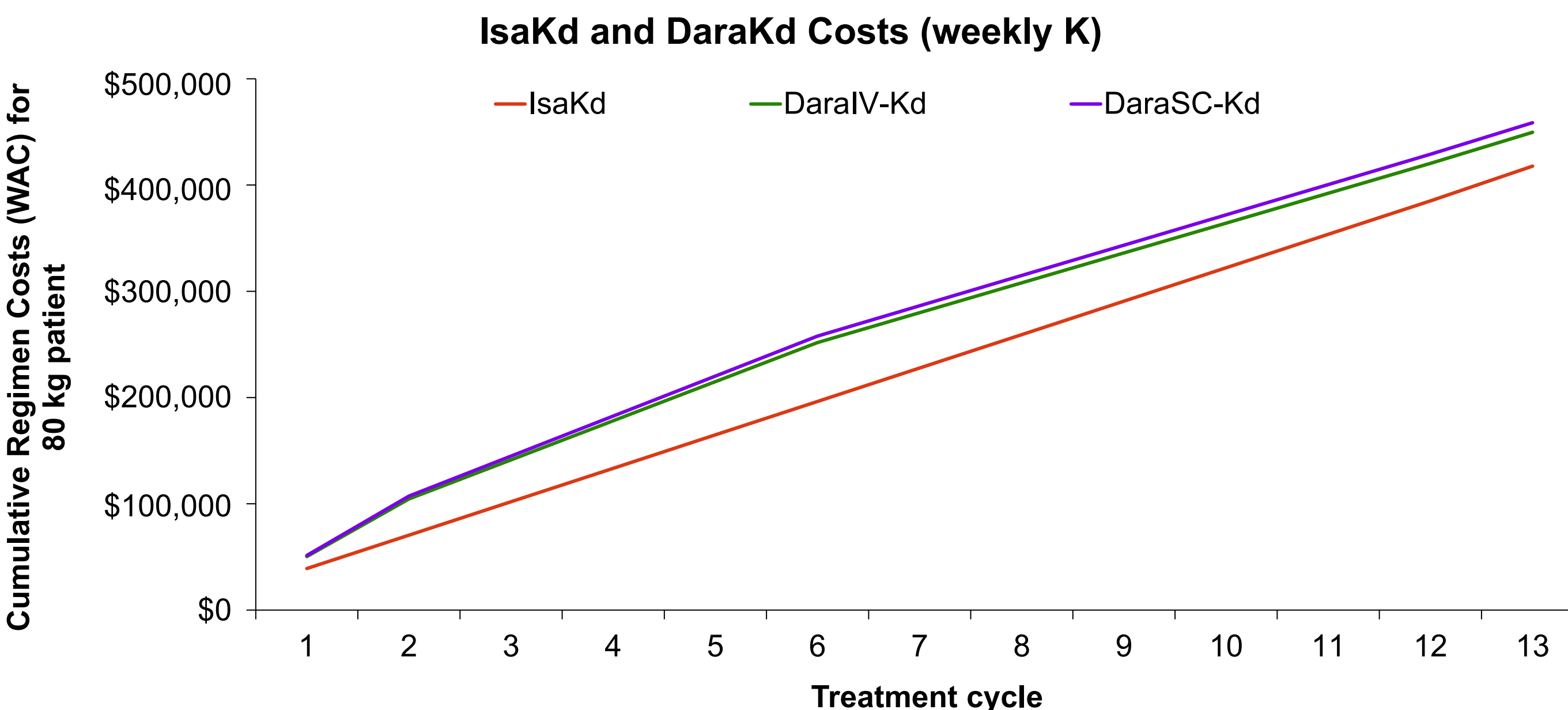
- With once-weekly K dosing, the first-year regimen costs of IsaKd, DaraIV-Kd, and DaraSC-Kd were \$379,772, \$397,369, and \$414,348 using ASP and \$417,800, \$449,613, and \$458,618 using WAC, respectively.
- With twice-weekly K dosing, the first-year regimen costs of IsaKd, DaraIV-Kd, and DaraSC-Kd increased to \$533,797, \$551,394, and \$568,373 using ASP and \$590,137, \$621,950, and \$630,954 using WAC, respectively.
- Taking the real-world utilization of K, the total regimen costs of IsaKd, DaraIV-Kd, and DaraSC-Kd at 6-month (using real-work K dosing as shown in Figure 1) were \$214,350, \$239,429, and \$251,469 using ASP and \$236,020, \$271,499, and \$277,796 using WAC, respectively (Table 3).

Table 2. Total Year-1 Regimen Costs for 80 kg Patient with RRMM–Dosing per Label

	Isatuximab		Daratumumab			
	IsaKd		DaraIV-Kd		DaraSC-Kd	
	Weekly K	Twice-weekly K	Weekly K	Twice-weekly K	Weekly K	Twice-weekly K
ASP	\$379,772	\$533,797	\$397,369	\$551,394	\$414,348	\$568,373
WAC	\$417,800	\$590,137	\$449,613	\$621,950	\$458,618	\$630,954

Note: ASP and WAC: Q3, 2023. ASP, Average Sales Price; d, dexamethasone; Dara, daratumumab; Isa, isatuximab; IV, intravenous; K, carfilzomib; Q3, quarter three; RRMM, relapsed refractory multiple myeloma; SC, subcutaneous; WAC, Wholesaler Acquisition Cost. \$, US Dollar.

Figure 2a-2b. Total Year-1 Regimen Costs for 80 kg Patient with RRMM–Dosing per Label, WAC



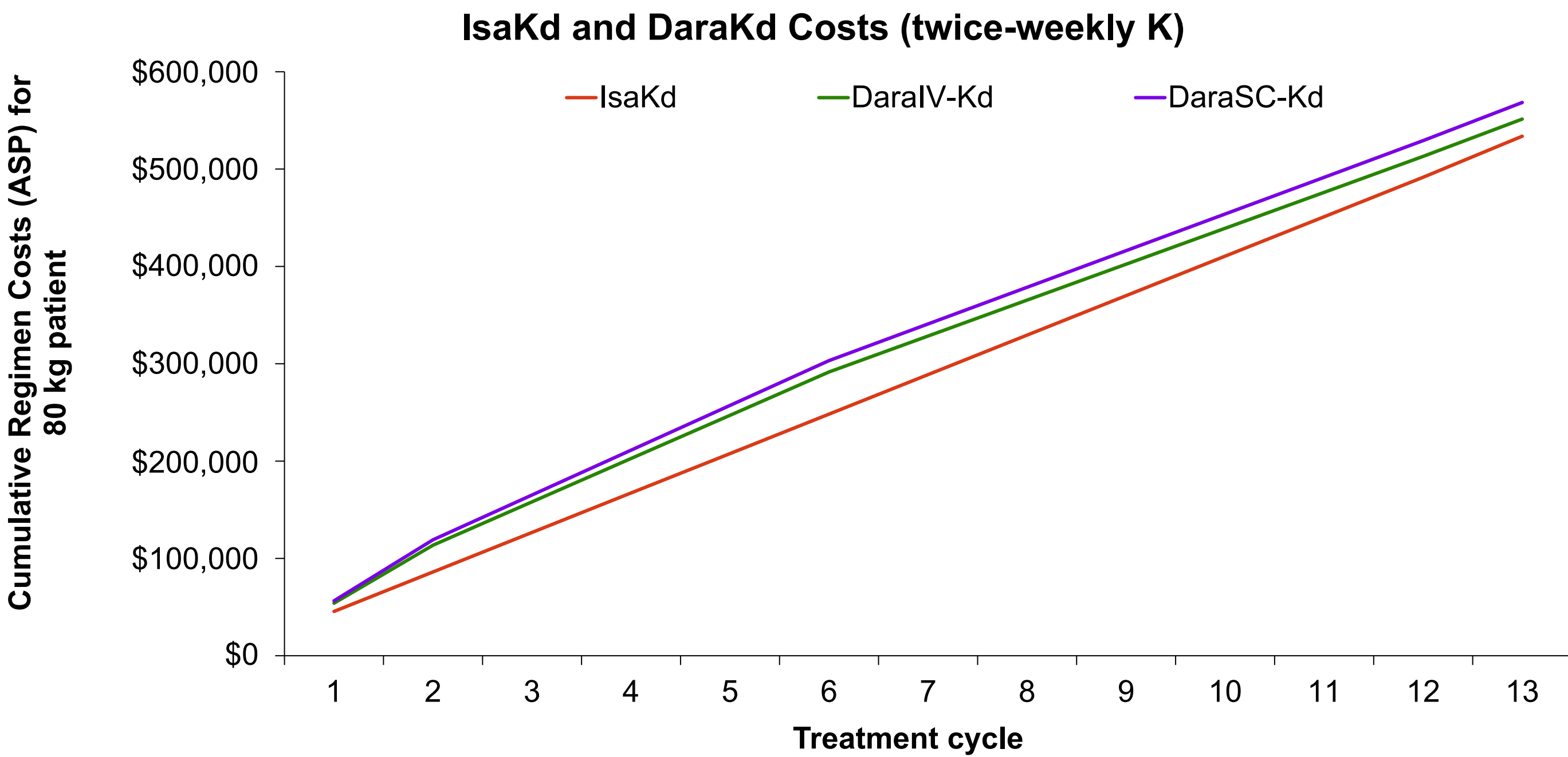
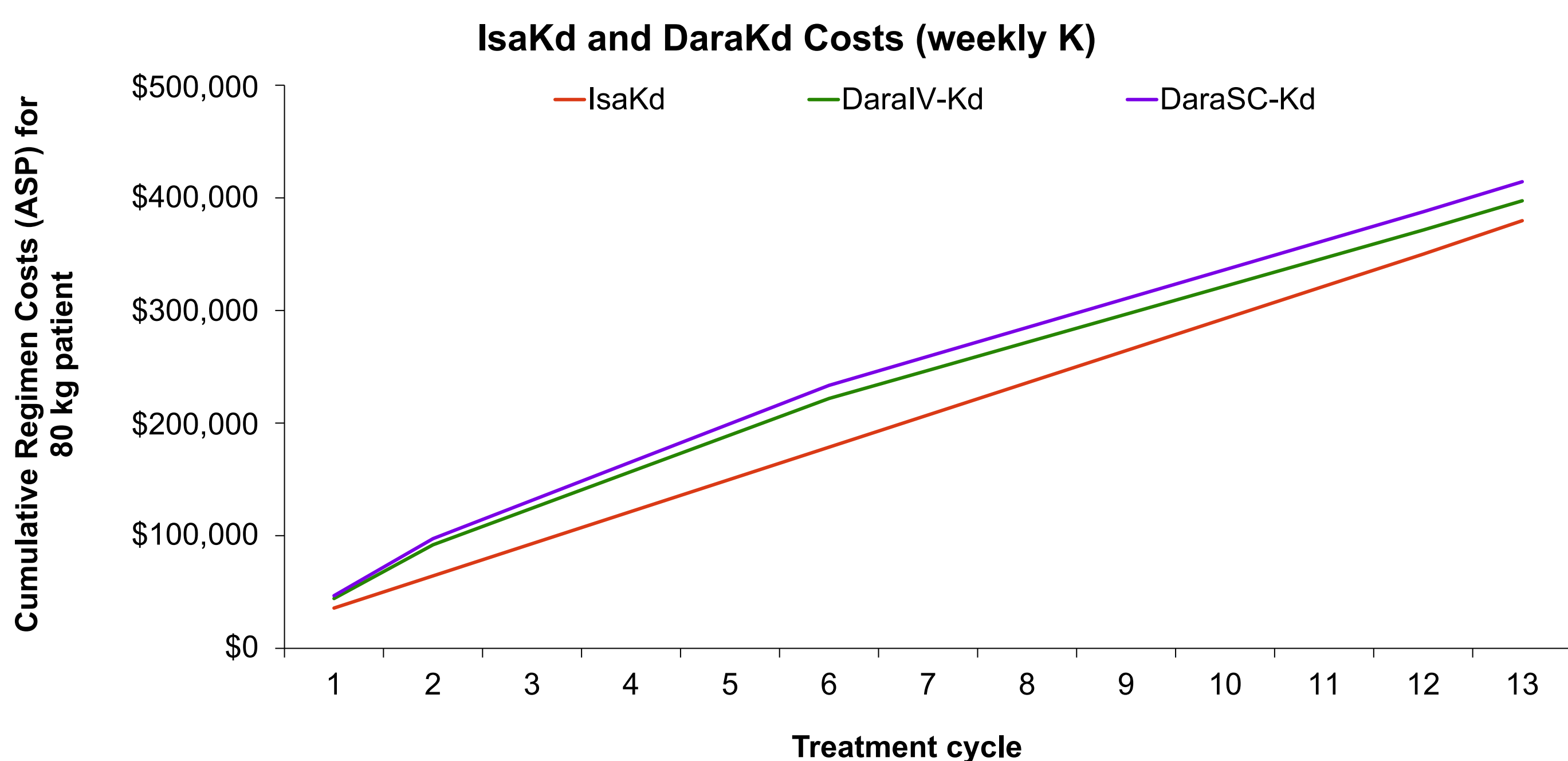
Note: Prices based on Q3, 2023 WAC. d, dexamethasone; Dara, daratumumab; Isa, isatuximab; IV, intravenous; K, carfilzomib; Q3, quarter three; RRMM, relapsed refractory multiple myeloma; SC, subcutaneous; WAC, Wholesaler Acquisition Cost; \$, US Dollar.

Table 3. Total Regimen Costs at 6-month for 80 kg Patient with RRMM–Dosing per Real-World K Utilization

	Isatuximab	Daratumumab	
	IsaKd	DaraIV-Kd	DaraSC-Kd
ASP	\$214,350	\$239,429	\$251,469
WAC	\$236,020	\$271,499	\$277,796

Note: ASP and WAC: Q3, 2023. ASP, Average Sales Price; d, dexamethasone; Dara, daratumumab; Isa, isatuximab; IV, intravenous; K, carfilzomib; Q3, quarter three; RRMM, relapsed refractory multiple myeloma; SC, subcutaneous; WAC, Wholesaler Acquisition Cost. \$, US Dollar.

Figure 3a-3b. Total Year-1 Regimen Costs for 80 kg Patient with RRMM–Dosing per Label, ASP



Note: Prices based on Q3, 2023 ASP. ASP, Average Sales Price; d, dexamethasone; Dara, daratumumab; Isa, isatuximab; IV, intravenous; K, carfilzomib; Q3, quarter three; RRMM, relapsed refractory multiple myeloma; SC, subcutaneous; \$, US Dollar.

Limitations

- Real-world utilization data used on K once- vs twice-weekly dosing in the IsaKd and DaraKd regimens were based on Flatiron data which might not be generalizable to patients outside of this database.
- Only medication costs of the studied regimens were considered, ignoring other disease-related costs in this model.

Conclusions

- IsaKd incurs lower regimen cost than DaraIV-Kd and DaraSC-Kd in the first year, assuming same dosing schedule of K.
- With real-world K dosing, the total regimen cost of IsaKd at 6-month was 10%–15% lower than DaraKd.
- Future research is warranted to fully characterize real-world utilization pattern of anti-CD38 regimens, such as drug dosing schedule and adherence to, and duration of treatment, to better understand the economic impact of treatment choice in RRMM.

CONFLICTS OF INTEREST: All authors are employees of Sanofi and may hold stocks and/or stock options in the company.

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