Simsurveys

HCAHPS Hospital Experience Survey

Validation Study: Simulated Data vs. CMS National Results

Reference: HCAHPS 2024 (CMS, Jan–Dec 2024 discharges, Oct 2025 public report)

Live: ~631,000 completed surveys (4,304 US hospitals) | Simulated: n = 1,000 simulated respondents

February 20, 2026

Executive Summary

This report presents a baseline validation study comparing simulated survey data generated by Simsurveys against nationally reported results from the HCAHPS (Hospital Consumer Assessment of Healthcare Providers and Systems) survey. HCAHPS is a CMS-mandated national standard that measures patient experience across US acute care hospitals, with results publicly reported and linked to hospital reimbursement. It is the most widely used patient experience benchmark in US healthcare.

The reference dataset comprises approximately 631,000 completed surveys collected from 4,304 participating hospitals during January–December 2024, as reported in the October 2025 CMS public release. The survey covers 21 questions across seven domains: nurse communication, doctor communication, hospital environment, staff responsiveness, medication communication, discharge information, and care transitions. CMS publicly reports results using 3-level groupings (e.g., Always / Usually / Sometimes-or-Never), which serve as the validation benchmarks.

Simsurveys generated n = 1,000 synthetic respondents using its consumer simulation model. This represents a baseline test of the general consumer model before any fine-tuning on patient-specific training data. The simulation was configured with the HCAHPS questionnaire including embedded skip logic (gate questions at Q10 and Q12), and targeted to a US general adult population with no special demographic quotas.

Alignment is assessed using Kullback–Leibler (KL) Divergence, which measures distributional similarity between live and simulated response distributions. All 19 measured questions are single-select with 2–3 response options. KL values below 0.15 indicate strong distributional alignment where insights from simulated data would lead to substantively equivalent conclusions as live data.

As a pre-fine-tuning baseline, the model demonstrates correct directional alignment across all questions—the rank ordering of response categories is preserved in every case. The primary systematic pattern is a central tendency effect: the model understates extreme positive responses ("Always", "Strongly agree") and overstates moderate responses ("Usually", "Agree"). This is expected behavior for a general consumer model encountering healthcare's unusually strong positive skew, where top-box scores routinely exceed 70–80%. Fine-tuning on patient-specific data is expected to calibrate this intensity and substantially improve distributional match.

KL Divergence Summary

| ID	Question	Section	KL Div	Status
Q1	How often did nurses treat you with courtesy and respect?	Your Care from Nurses	0.134	✓ Good
Q2	How often did nurses listen carefully to you?	Your Care from Nurses	0.071	✓ Good
Q3	How often did nurses explain things in a way you could un...	Your Care from Nurses	0.081	✓ Good
Q4	How often did doctors treat you with courtesy and respect?	Your Care from Doctors	0.120	✓ Good
Q5	How often did doctors listen carefully to you?	Your Care from Doctors	0.099	✓ Good
Q6	How often did doctors explain things in a way you could u...	Your Care from Doctors	0.132	✓ Good
Q7	How often were your room and bathroom kept clean?	The Hospital Environment	0.084	✓ Good
Q8	How often was the area around your room quiet at night?	The Hospital Environment	0.153	Review
Q9	How often did you get help as soon as you needed?	Your Experiences in Th...	0.042	✓ Good
Q11	How often did you get help getting to the bathroom as soo...	Your Experiences in Th...	0.082	✓ Good
Q13	How often did hospital staff tell you what the new medici...	Communication About Me...	0.117	✓ Good
Q14	How often did staff describe possible side effects of new...	Communication About Me...	0.056	✓ Good
Q15	Did staff talk with you about help you would need after l...	Leaving the Hospital	0.059	✓ Good
Q16	Did you get written info about symptoms to look out for a...	Leaving the Hospital	0.159	Review
Q17	Did staff help you to rest and recover?	Care Transition	0.022	✓ Good
Q18	Did you clearly understand your responsibilities in manag...	Care Transition	0.041	✓ Good
Q19	Did you clearly understand the purpose for taking each me...	Care Transition	0.112	✓ Good
Q20	Rate this hospital (0–10 scale)	Overall Rating of Hosp...	0.087	✓ Good
Q21	Would you recommend this hospital to friends and family?	Overall Rating of Hosp...	0.071	✓ Good

Average KL Divergence: 0.091 | Median: 0.084

KL Divergence < 0.15 = strong alignment | 0.15–0.30 = moderate | > 0.30 = review needed

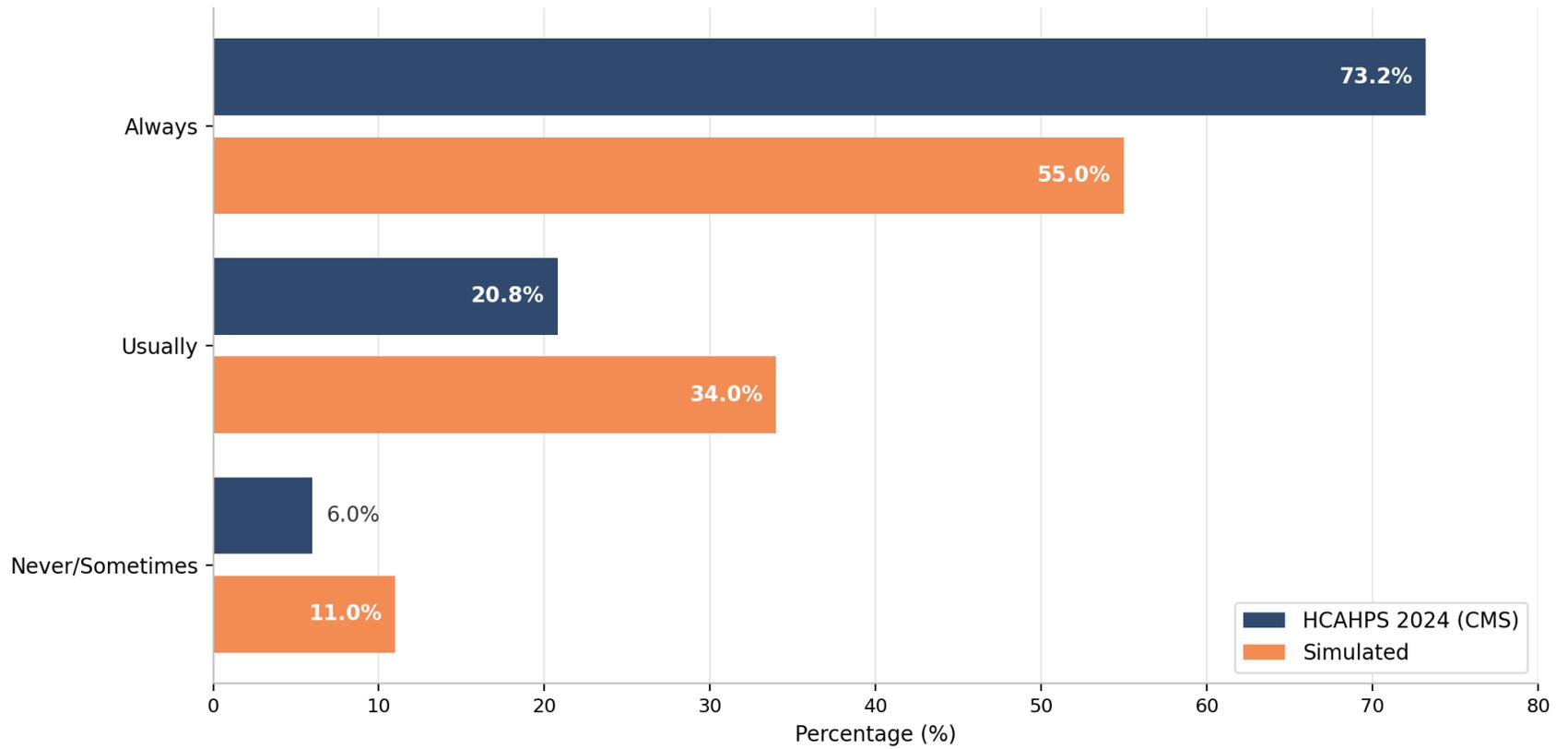Note: This is a baseline test using the general consumer model before patient-specific fine-tuning.

How often did nurses treat you with courtesy and respect?
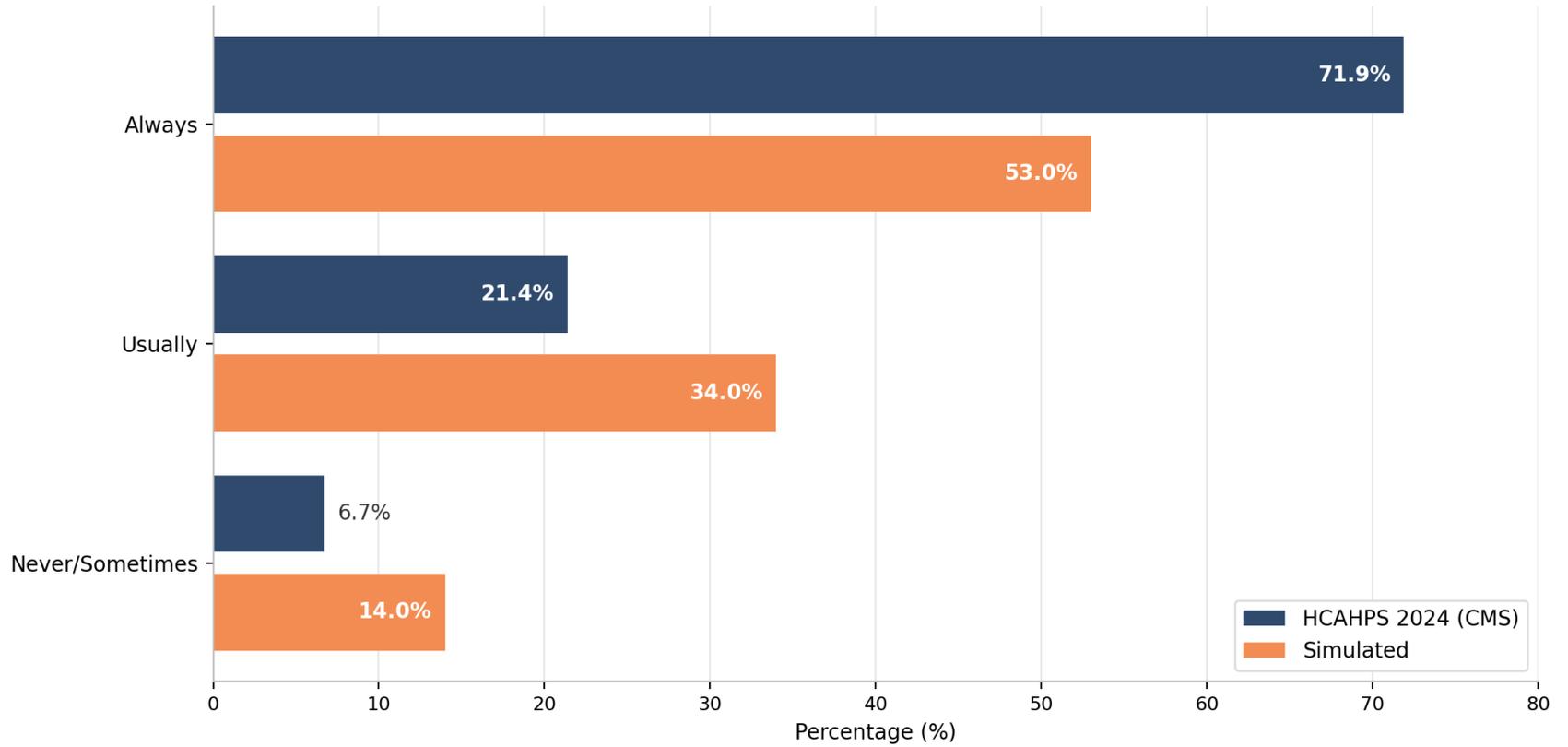
KL Divergence = 0.134
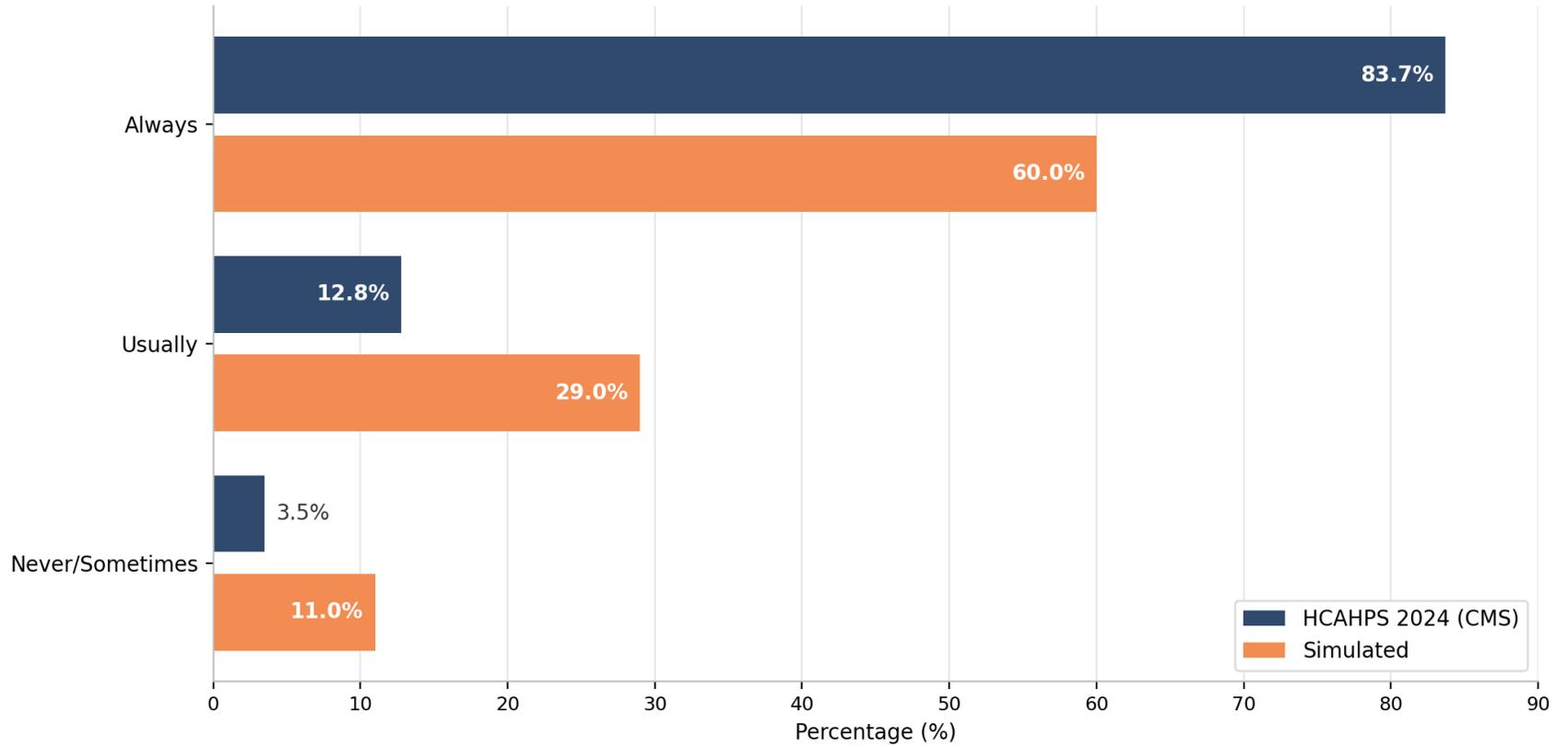
How often did nurses listen carefully to you?
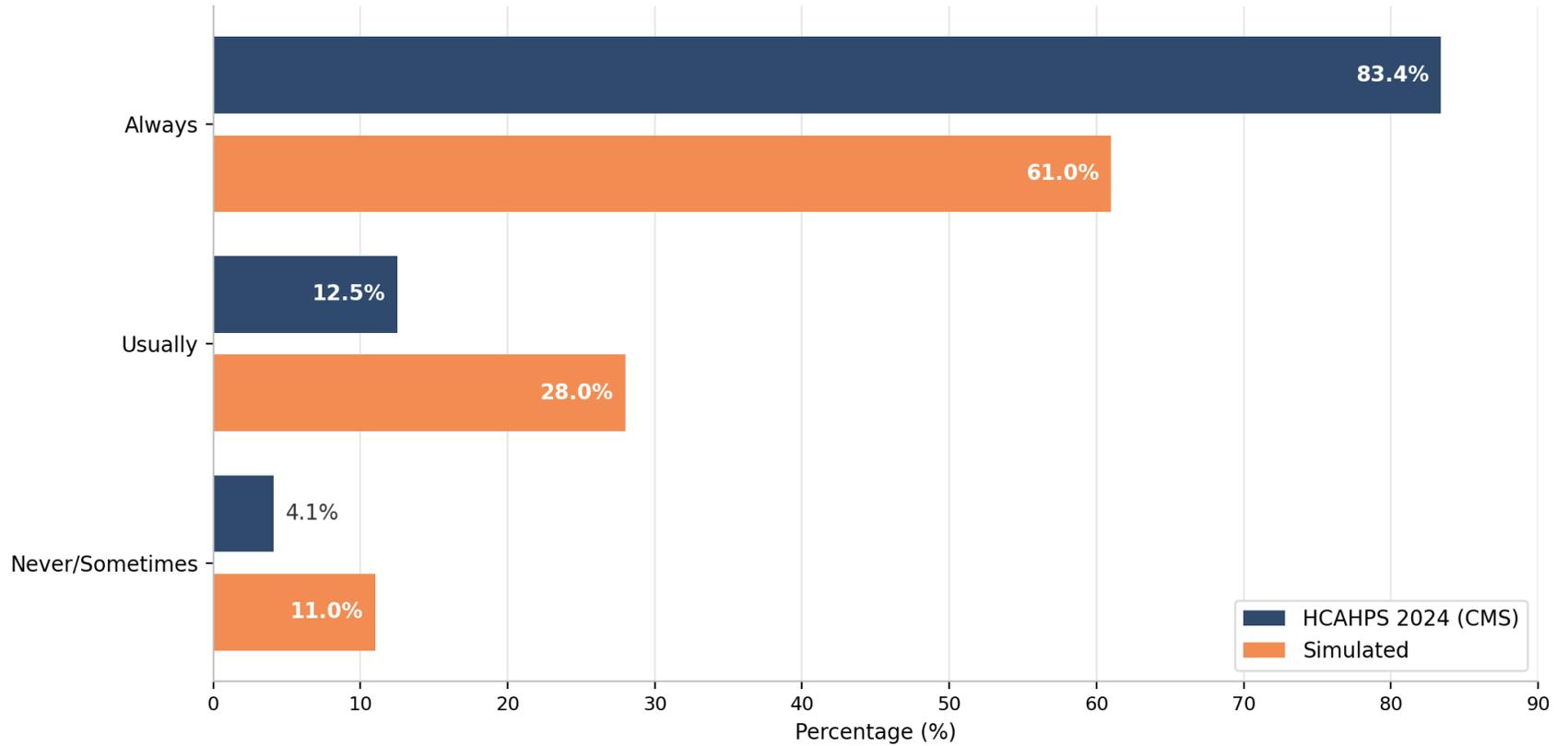
KL Divergence = 0.071

How often did nurses explain things in a way you could understand?
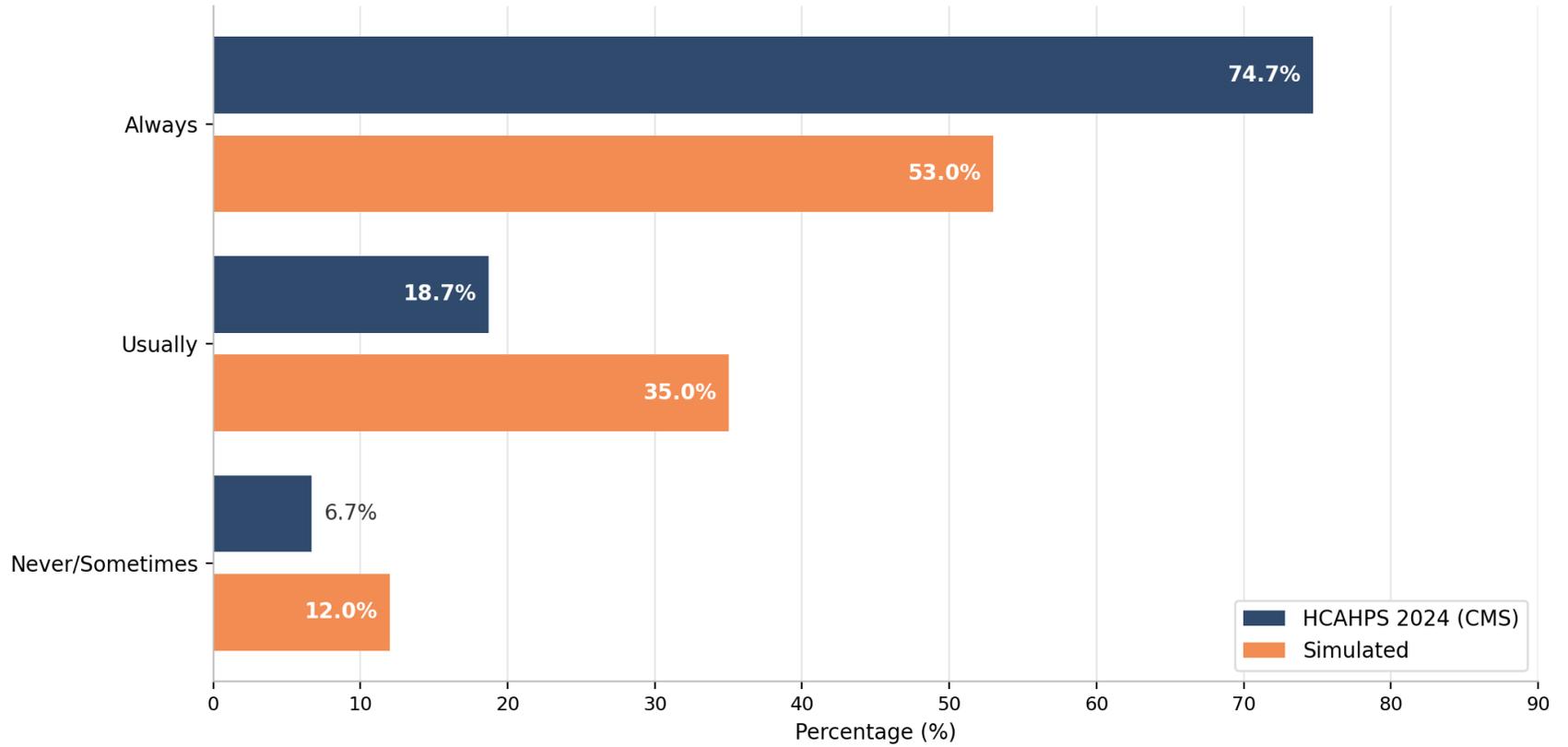
KL Divergence = 0.081

How often did doctors treat you with courtesy and respect?
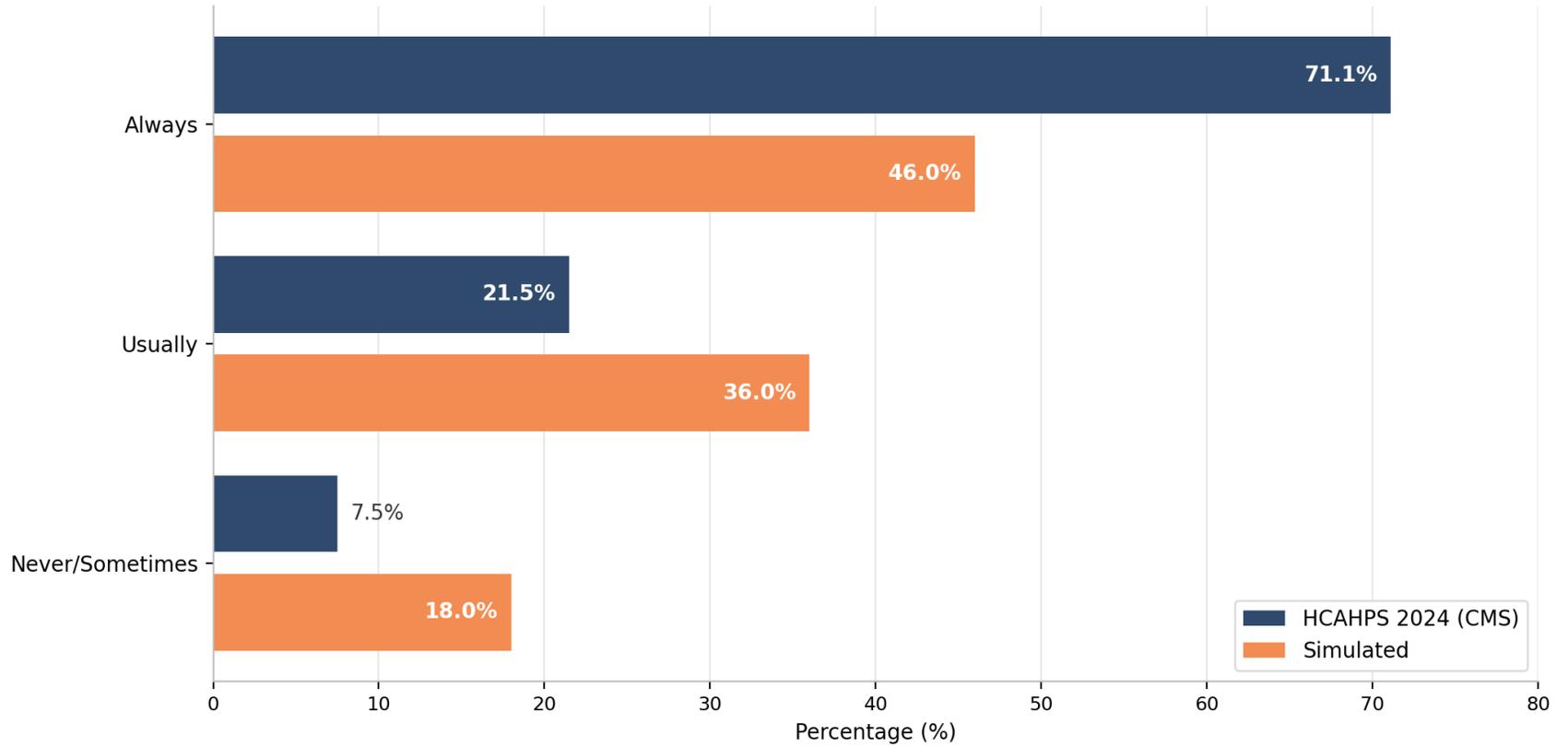
KL Divergence = 0.120

How often did doctors listen carefully to you?
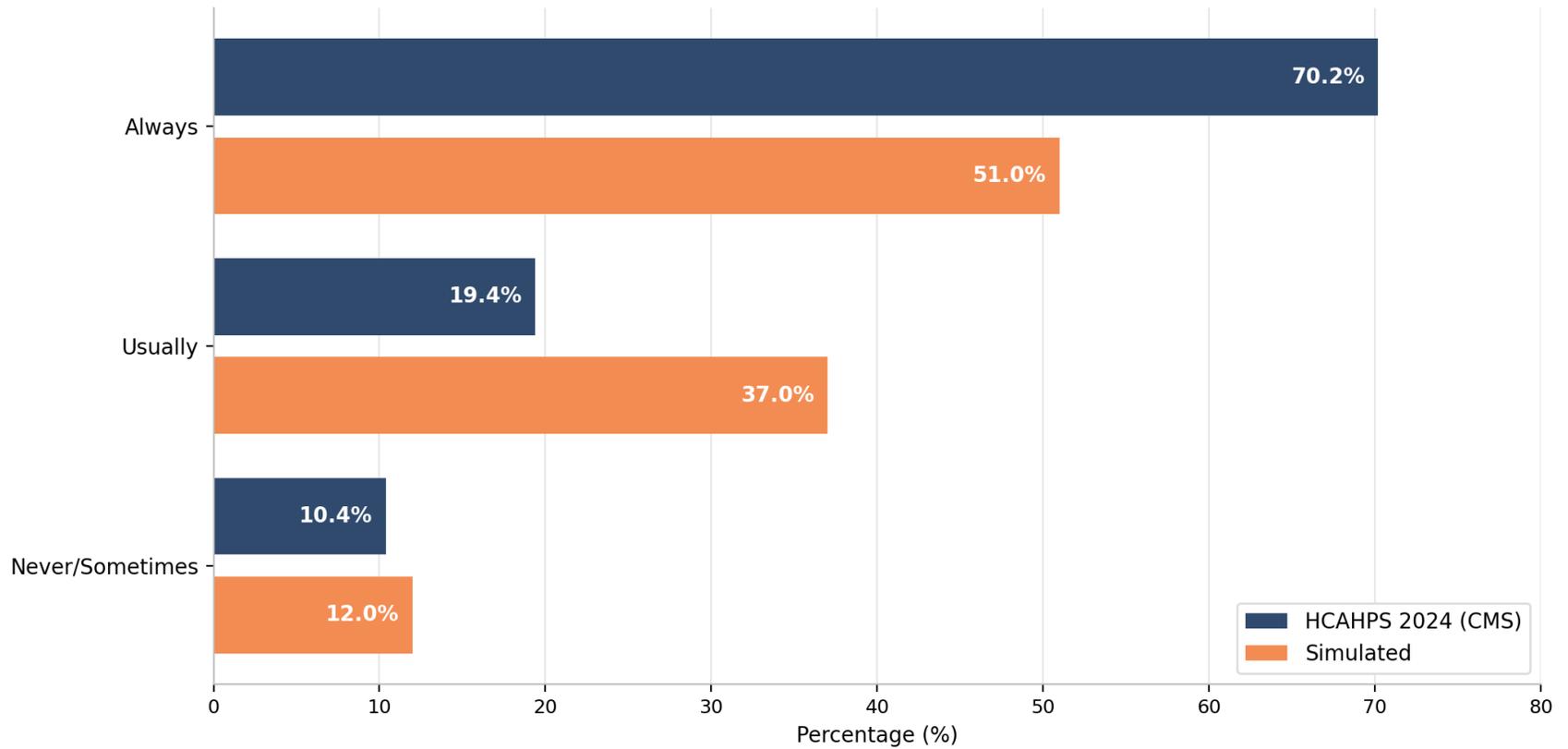
KL Divergence = 0.099

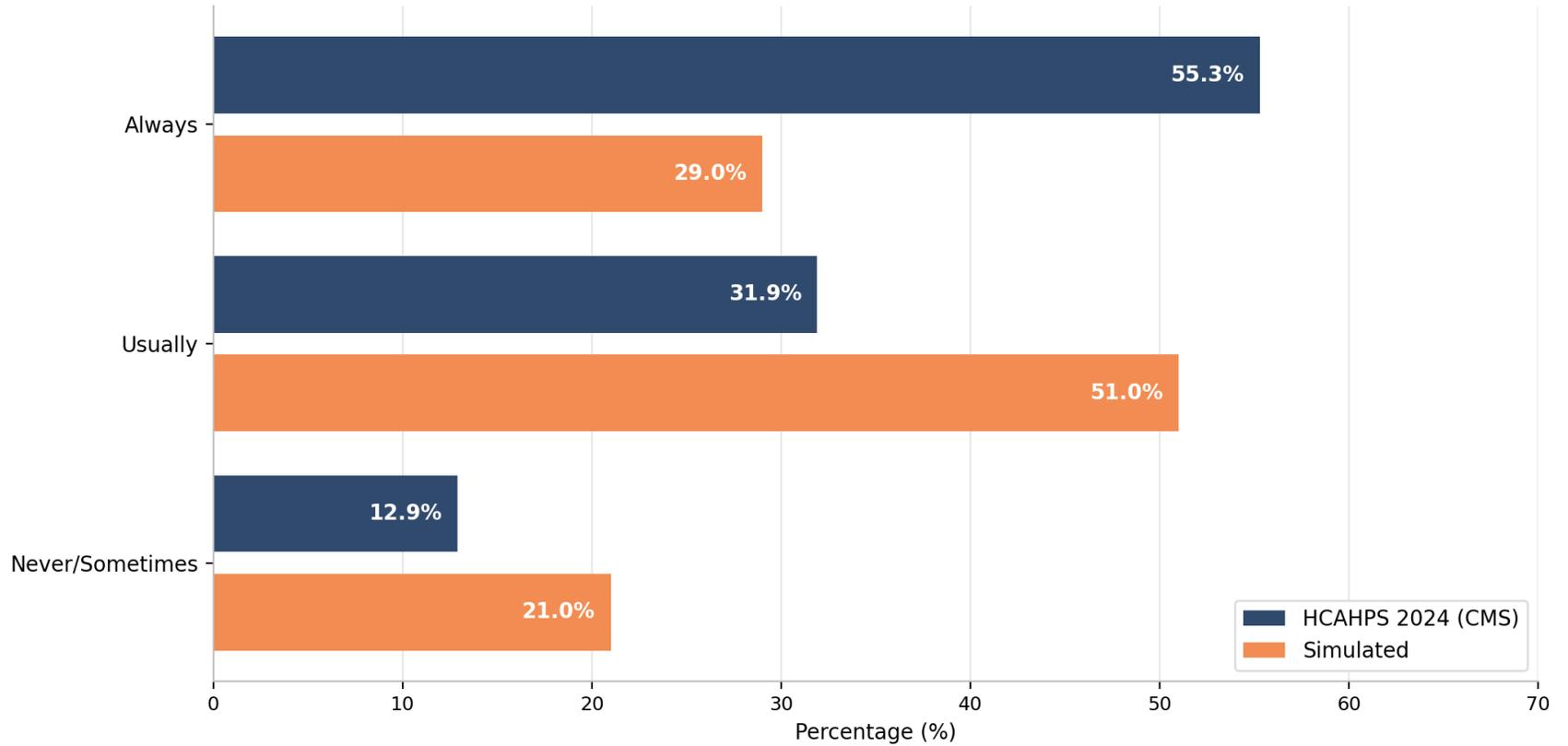# How often did doctors explain things in a way you could understand?

KL Divergence = 0.132

Legend:
- HCAHPS 2024 (CMS)
- Simulated

Category	HCAHPS 2024 (CMS)	Simulated
Always	71.1%	46.0%
Usually	21.5%	36.0%
Never/Sometimes	7.5%	18.0%

How often were your room and bathroom kept clean?

KL Divergence = 0.084

How often was the area around your room quiet at night?

KL Divergence = 0.153

## How often did you get help as soon as you needed?

KL Divergence = 0.042
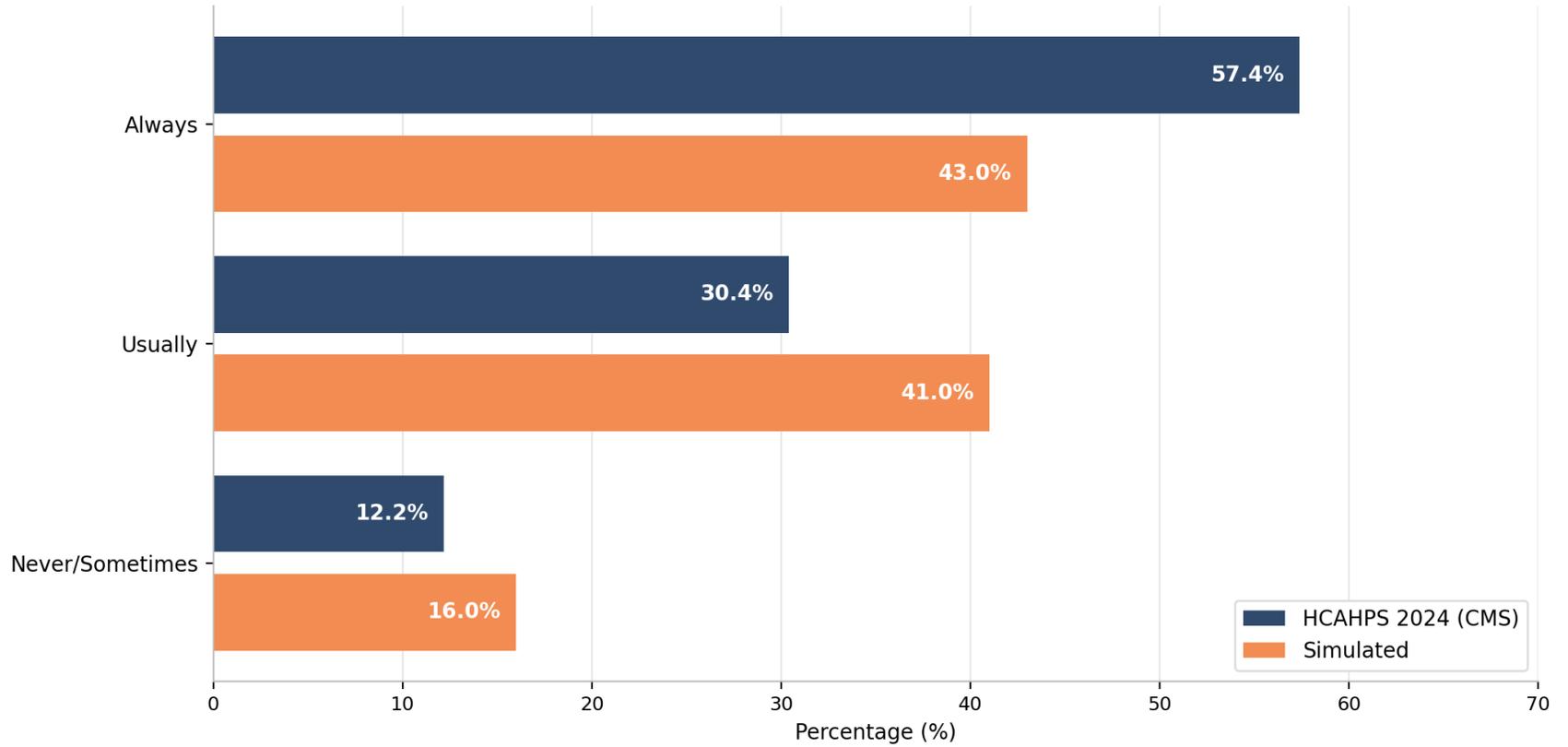
Always: HCAHPS 2024 (CMS) 57.4%, Simulated 43.0%
Usually: HCAHPS 2024 (CMS) 30.4%, Simulated 41.0%
Never/Sometimes: HCAHPS 2024 (CMS) 12.2%, Simulated 16.0%

Percentage (%)

Legend: HCAHPS 2024 (CMS), Simulated

Q11

How often did you get help getting to the bathroom as soon as you wanted?

Base: respondents who needed bathroom help (Q10=Yes, sim n=358)

KL Divergence = 0.082
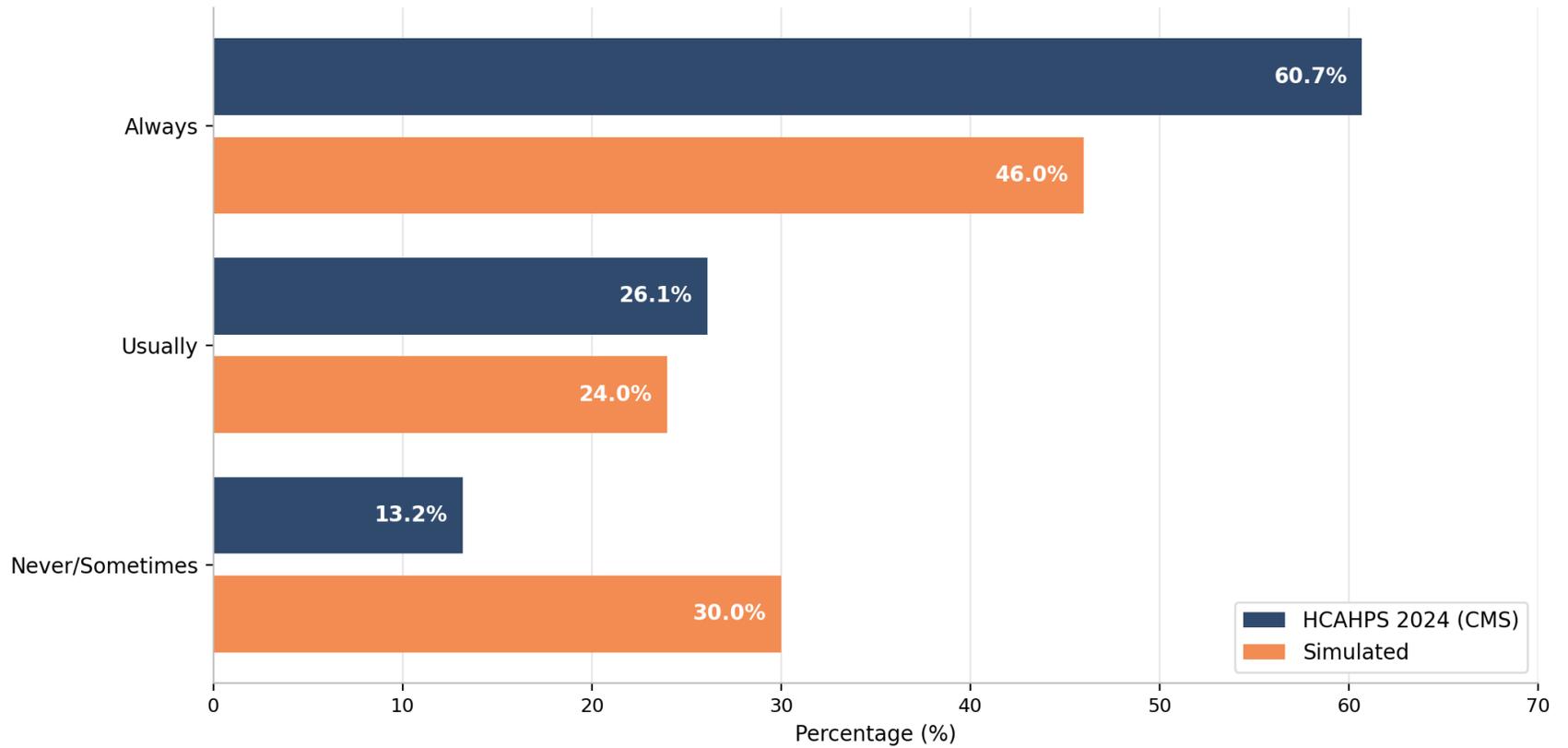
How often did hospital staff tell you what the new medicine was for?

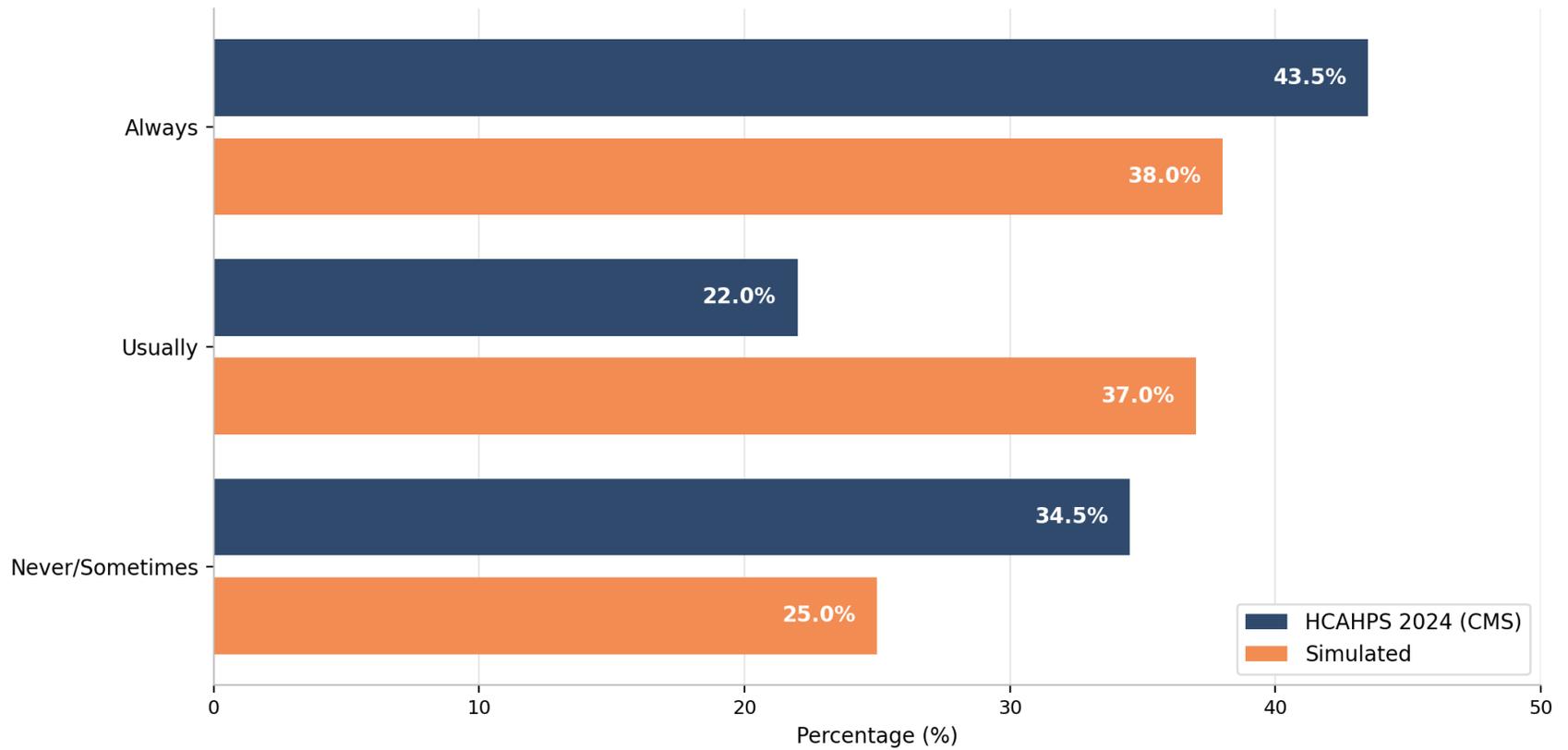*Base: respondents given new medicine (Q12=Yes, sim n=635)*

KL Divergence = 0.117
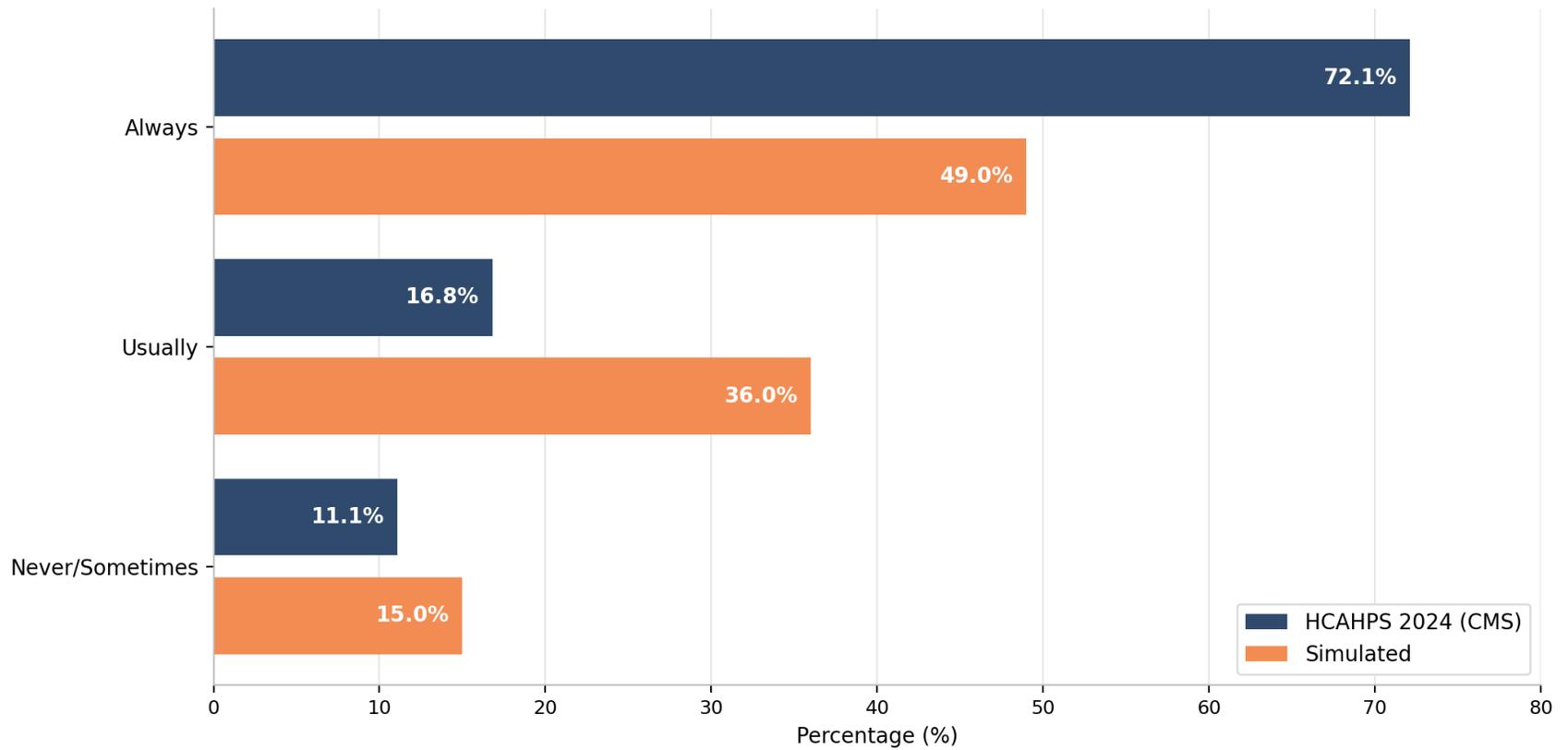
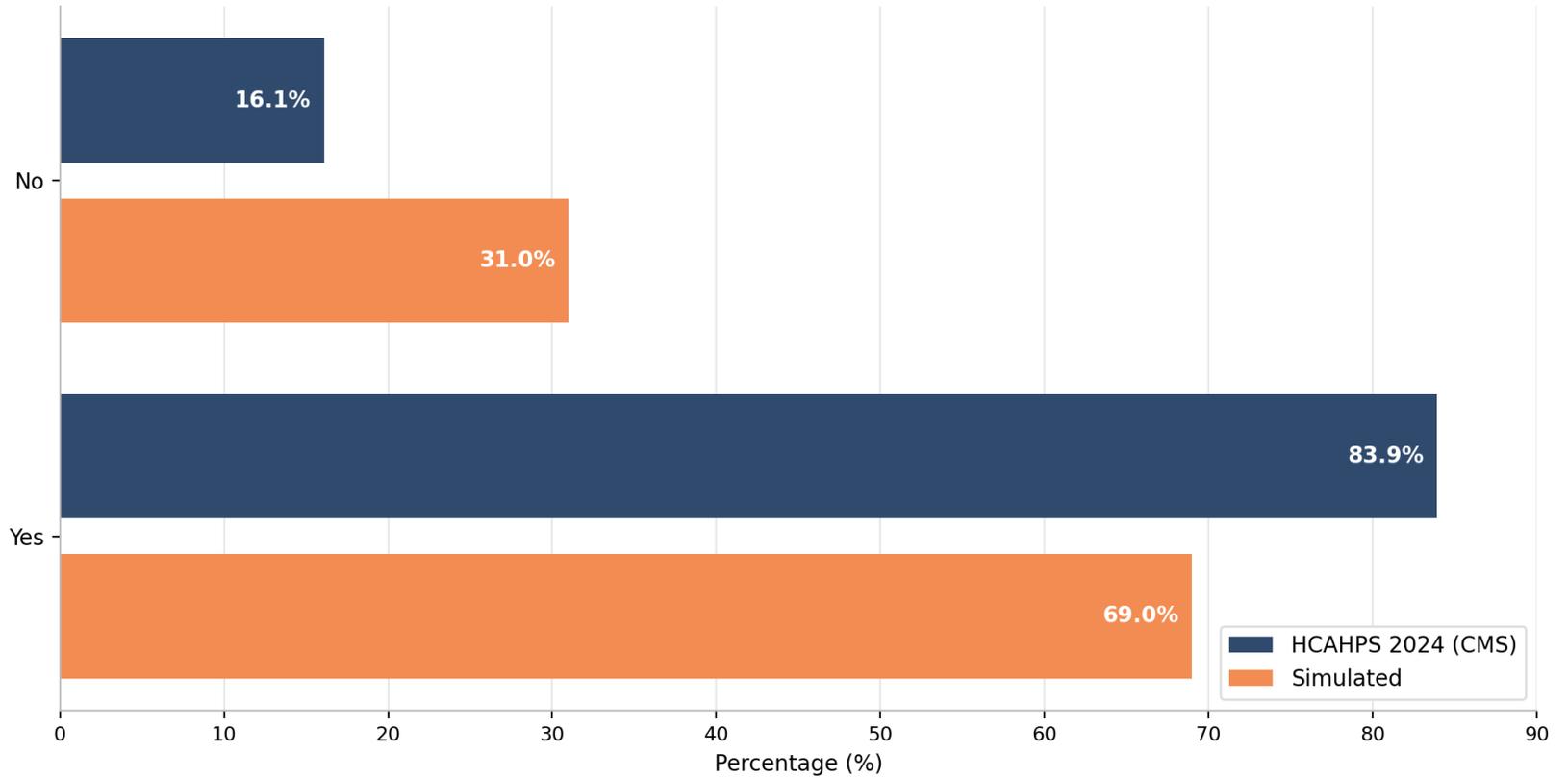## How often did staff describe possible side effects of new medicine?

Base: respondents given new medicine (Q12=Yes, sim n=635)
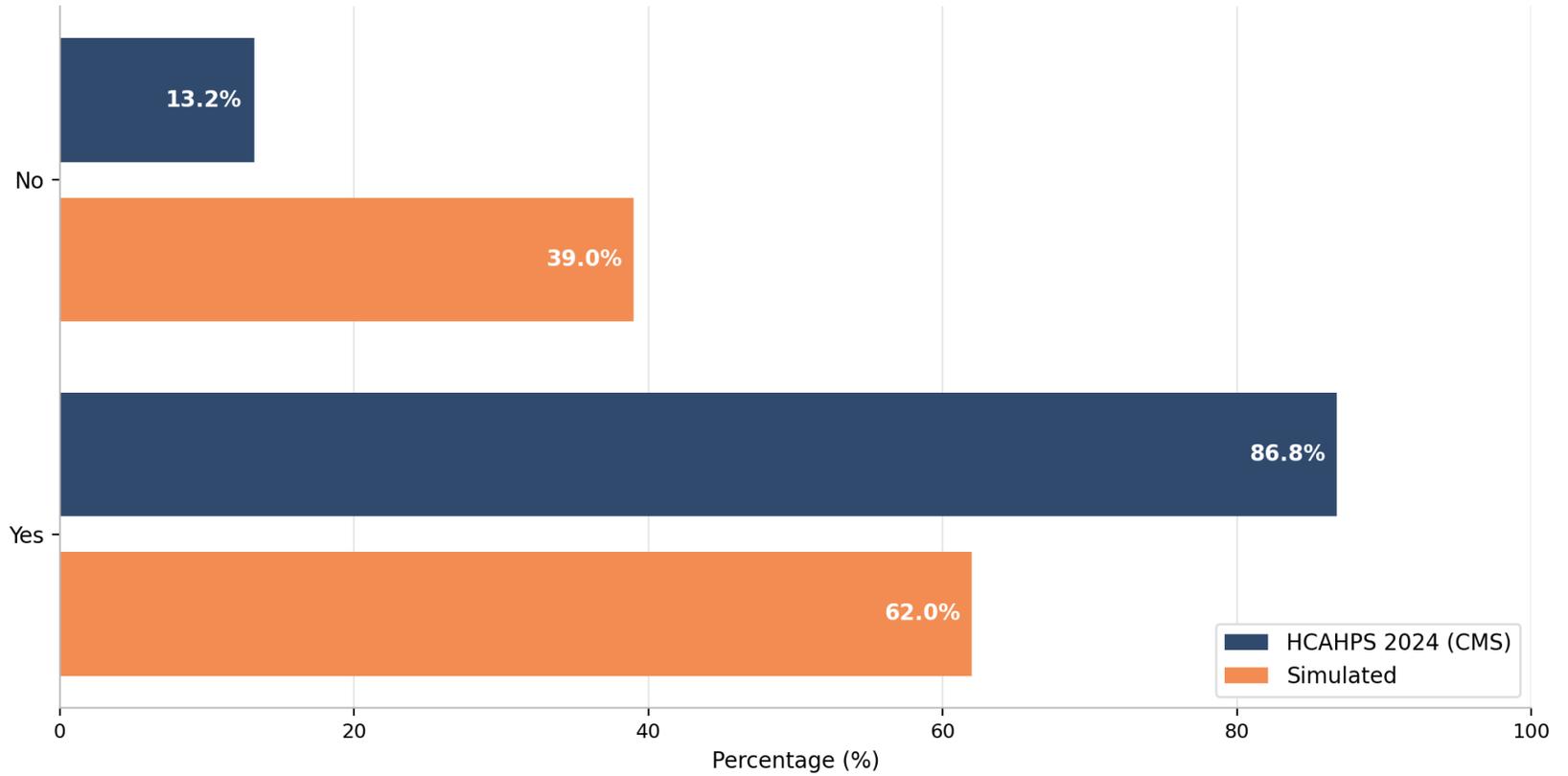
KL Divergence = 0.056

Did staff talk with you about help you would need after leaving?
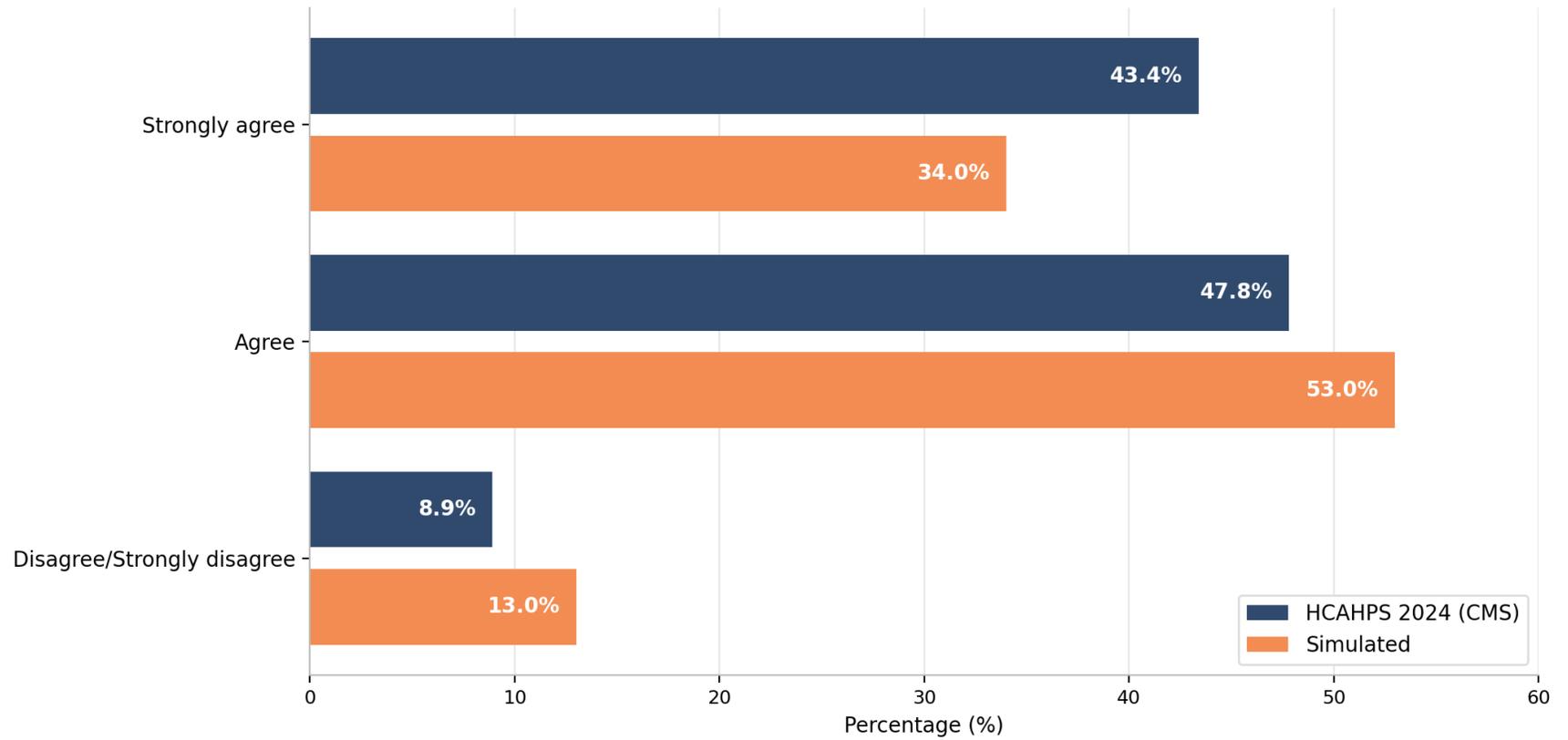
KL Divergence = 0.059

Did you get written info about symptoms to look out for after leaving?
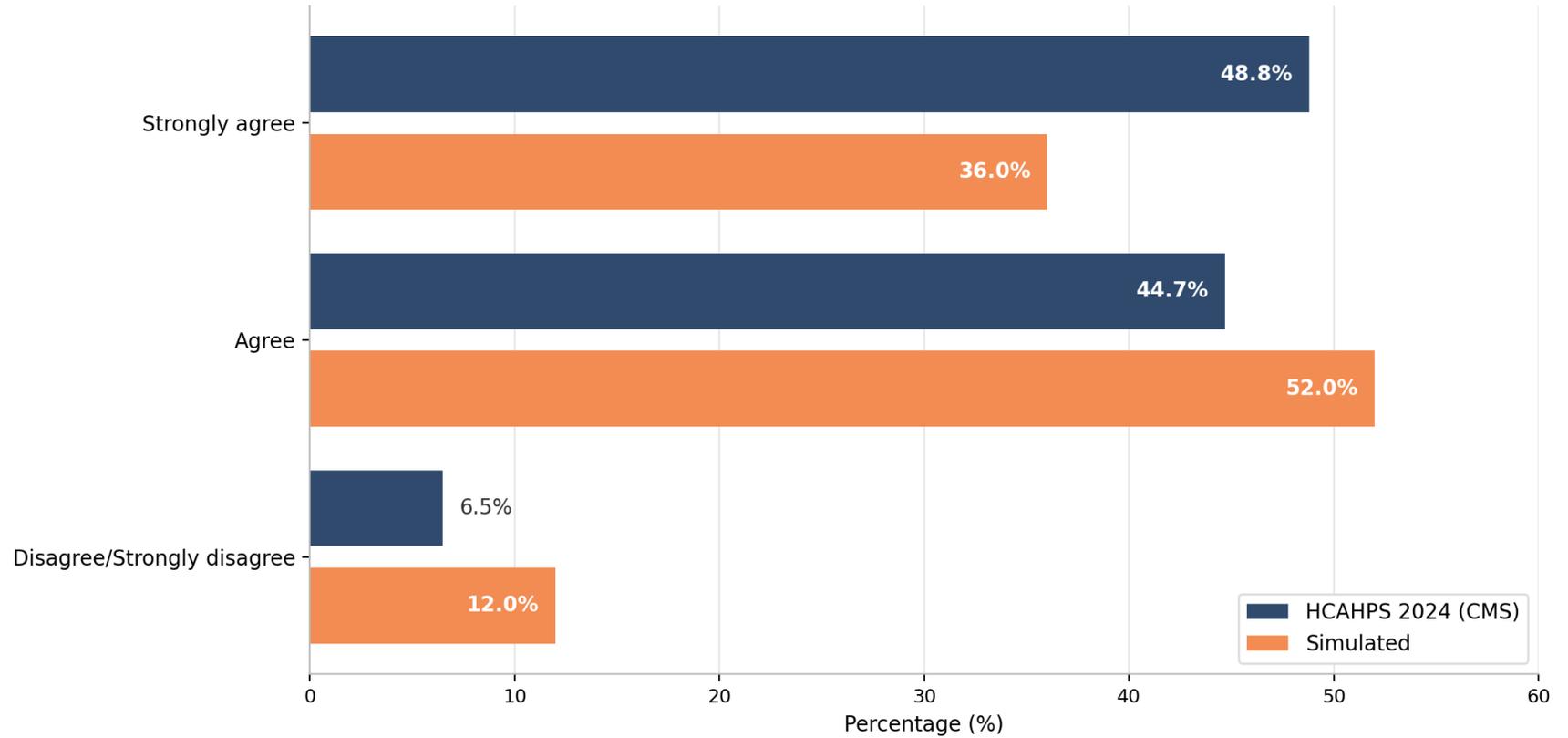
KL Divergence = 0.159

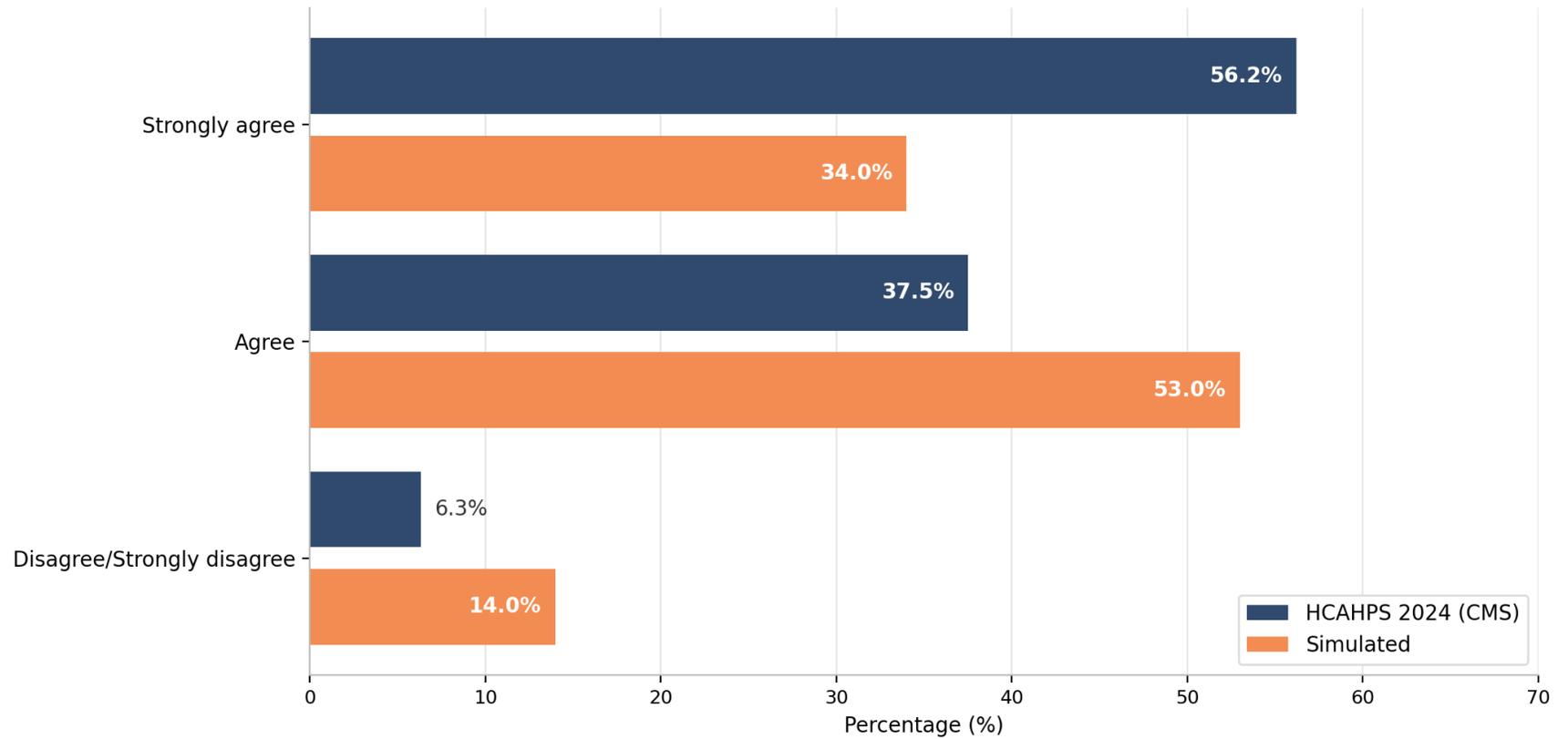## Did staff help you to rest and recover?

KL Divergence = 0.022

Did you clearly understand your responsibilities in managing your health?

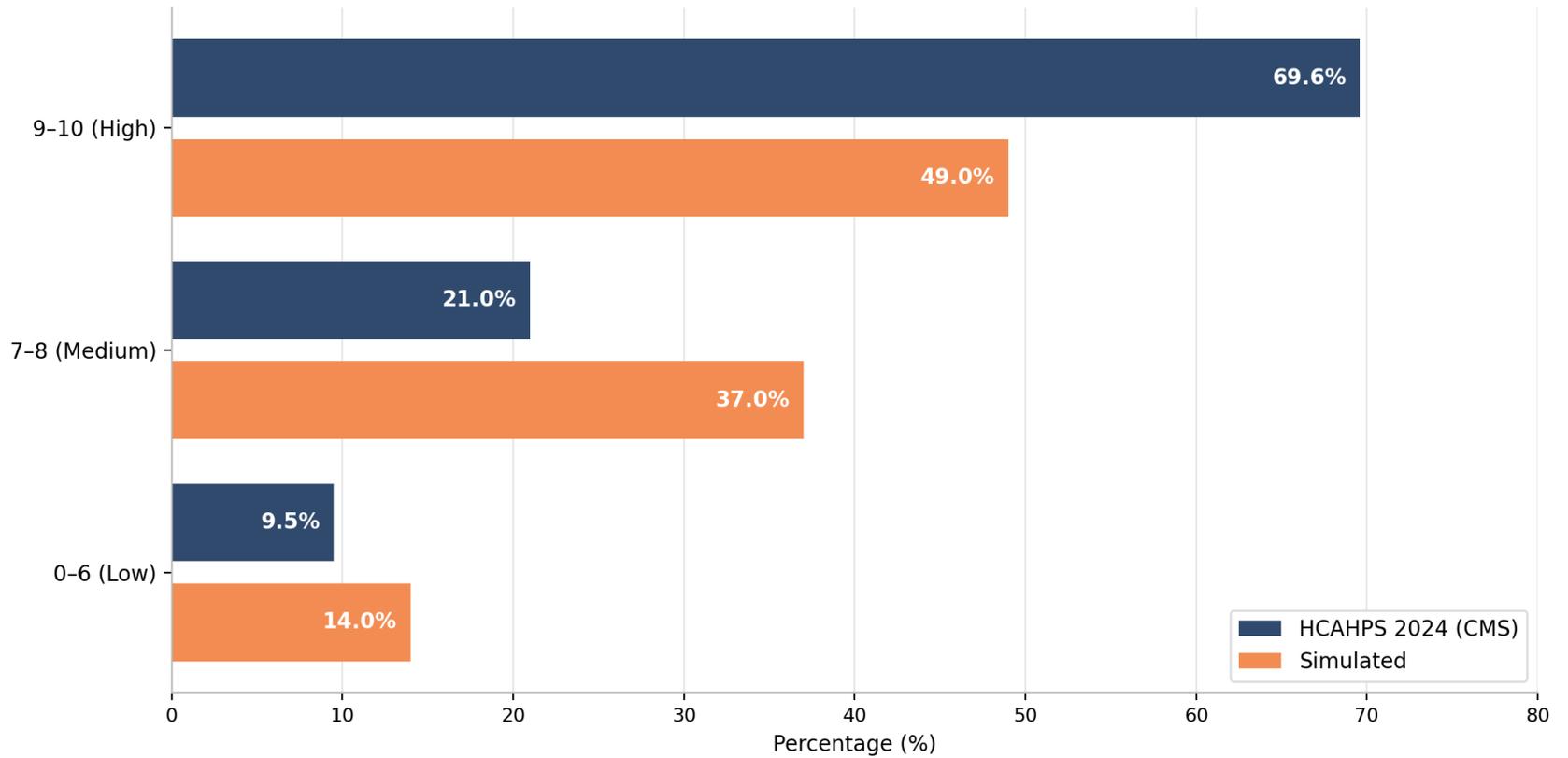KL Divergence = 0.041

Did you clearly understand the purpose for taking each medication?
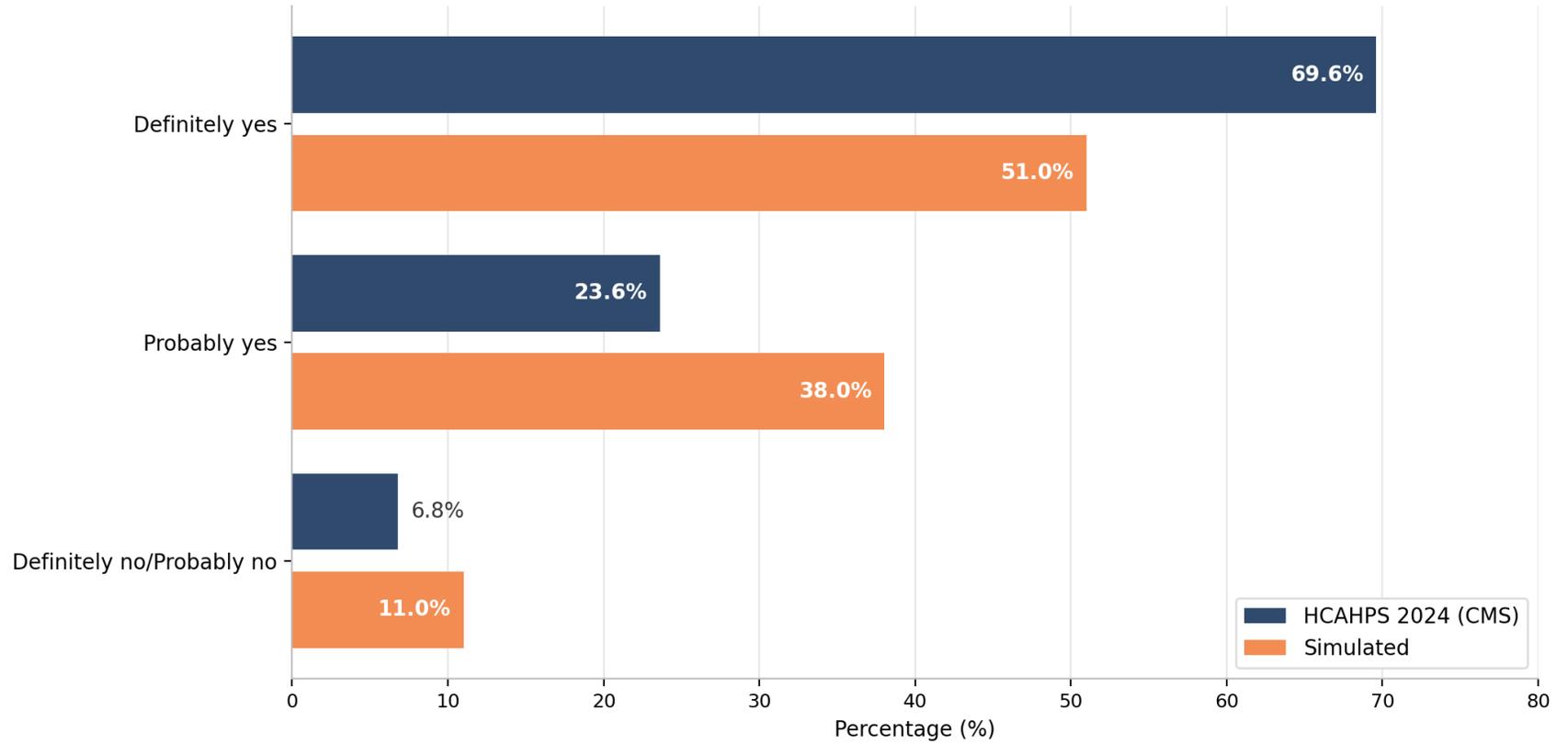
KL Divergence = 0.112

Rate this hospital (0–10 scale)

KL Divergence = 0.087

Would you recommend this hospital to friends and family?

KL Divergence = 0.071

Appendix: Survey Questions

Q1: How often did nurses treat you with courtesy and respect?

Responses: Never/Sometimes | Usually | Always

Q2: How often did nurses listen carefully to you?

Responses: Never/Sometimes | Usually | Always

Q3: How often did nurses explain things in a way you could understand?

Responses: Never/Sometimes | Usually | Always

Q4: How often did doctors treat you with courtesy and respect?

Responses: Never/Sometimes | Usually | Always

Q5: How often did doctors listen carefully to you?

Responses: Never/Sometimes | Usually | Always

Q6: How often did doctors explain things in a way you could understand?

Responses: Never/Sometimes | Usually | Always

Q7: How often were your room and bathroom kept clean?

Responses: Never/Sometimes | Usually | Always

Q8: How often was the area around your room quiet at night?

Responses: Never/Sometimes | Usually | Always

Appendix: Survey Questions (continued)

Q9: How often did you get help as soon as you needed?

Responses: Never/Sometimes | Usually | Always

Q11: How often did you get help getting to the bathroom as soon as you wanted? [Base: respondents who needed bathroom help (Q10=Yes, sim n=358)]

Responses: Never/Sometimes | Usually | Always

Q13: How often did hospital staff tell you what the new medicine was for? [Base: respondents given new medicine (Q12=Yes, sim n=635)]

Responses: Never/Sometimes | Usually | Always

Q14: How often did staff describe possible side effects of new medicine? [Base: respondents given new medicine (Q12=Yes, sim n=635)]

Responses: Never/Sometimes | Usually | Always

Q15: Did staff talk with you about help you would need after leaving?

Responses: Yes | No

Q16: Did you get written info about symptoms to look out for after leaving?

Responses: Yes | No

Q17: Did staff help you to rest and recover?

Responses: Disagree/Strongly disagree | Agree | Strongly agree

Q18: Did you clearly understand your responsibilities in managing your health?

Responses: Disagree/Strongly disagree | Agree | Strongly agree

Appendix: Survey Questions (continued)

Q19: Did you clearly understand the purpose for taking each medication?

Responses: Disagree/Strongly disagree | Agree | Strongly agree

Q20: Rate this hospital (0–10 scale)

Responses: 0–6 (Low) | 7–8 (Medium) | 9–10 (High)

Q21: Would you recommend this hospital to friends and family?

Responses: Definitely no/Probably no | Probably yes | Definitely yes