TABLE S1: THE 64 VIGNETTES

SET A: SURVEY 1			
Vignette identifier	Vignette Text	STARWAVe risk assessment	STARWAVe recommendation
1	**Patient age:** 4 years and 5 months **Sex:** male **Presenting complaint:** cough for 6 days **Current asthma:** none **Vomiting:** none **Temperature:** parent reports severe fever in the last 24hrs **Wheeze:** none **Inter/subcostal recession:** none	very low (1 risk factor present)	no prescription
2	**Patient age:** 2 years and 4 months **Sex:** female **Presenting complaint:** cough for 6 days **Current asthma:** none **Vomiting:** none **Temperature:** none **Wheeze:** present on examination **Inter/subcostal recession:** none	very low (1 risk factor present)	no prescription
3	**Patient age:** 8 months **Sex:** female **Presenting complaint:** cough for 3 days **Current asthma:** none **Vomiting:** none **Temperature:** parent reports severe fever in the last 24hrs **Wheeze:** none **Inter/subcostal recession:** none	normal (3 risk factors present)	no/delayed prescription
4	**Patient age:** 8 months **Sex:** female **Presenting complaint:** cough for 10 days **Current asthma:** none **Vomiting:** none **Temperature:** parent reports severe fever in the last 24hrs **Wheeze:** present on examination **Inter/subcostal recession:** none	normal (3 risk factors present)	no/delayed prescription
5	**Patient age:** 8 months **Sex:** female **Presenting complaint:** cough for 9 days **Current asthma:** none **Vomiting:** parent reports moderate vomiting in the last 24hrs **Temperature:** none **Wheeze:** present on examination **Inter/subcostal recession:** none	normal (3 risk factors present)	no/delayed prescription

6	**Patient age:** 1 year and 8 months **Sex:** male **Presenting complaint:** cough for 3 days **Current asthma:** present **Vomiting:** none **Temperature:** none **Wheeze:** none **Inter/subcostal recession:** none	normal (3 risk factors present)	no/delayed prescription
7	**Patient age:** 3 years and 2 months **Sex:** male **Presenting complaint:** cough for 10 days **Current asthma:** present **Vomiting:** none **Temperature:** parent reports severe fever in the last 24hrs **Wheeze:** present on examination **Inter/subcostal recession:** none	normal (3 risk factors present)	no/delayed prescription
8	**Patient age:** 9 months **Sex:** male **Presenting complaint:** cough for 9 days **Current asthma:** none **Vomiting:** none **Temperature:** parent reports severe fever in the last 24hrs **Wheeze:** absent **Inter/subcostal recession:** present on examination	normal (3 risk factors present)	no/delayed prescription
9	**Patient age:** 1 year and 4 months **Sex:** female **Presenting complaint:** cough for 14 days **Current asthma:** none **Vomiting:** parent reports moderate vomiting in the last 24hrs **Temperature:** none **Wheeze:** none **Inter/subcostal recession:** present on examination	normal (3 risk factors present)	no/delayed prescription
10	**Patient age:** 2 years and 10 months **Sex:** male **Presenting complaint:** cough for 2 days **Current asthma:** none **Vomiting:** none **Temperature:** none **Wheeze:** present on examination **Inter/subcostal recession:** present on examination	normal (3 risk factors present)	no/delayed prescription
11	**Patient age:** 2 years and 9 months **Sex:** male **Presenting complaint:** cough for 1 day **Current asthma:** present **Vomiting:** none **Temperature:** none **Wheeze:** none **Inter/subcostal recession:** present on examination	normal (3 risk factors present)	no/delayed prescription

12	**Patient age:** 10 months **Sex:** male **Presenting complaint:** cough for 3 days **Current asthma:** none **Vomiting:** parent reports moderate vomiting in the last 24hrs **Temperature:** parent reports severe fever in the last 24hrs **Wheeze:** present on examination **Inter/subcostal recession:** none	high (5 risk factors present)	GP review within 24hrs and/or immediate prescription
13 †	**Patient age:** 4 years and 4 months **Sex:** male **Presenting complaint:** cough for 3 days **Current asthma:** present **Vomiting:** parent reports severe vomiting in the last 24hrs **Temperature:** parent reports severe fever in the last 24hrs **Wheeze:** present on examination **Inter/subcostal recession:** none	high (5 risk factors present)	GP review within 24hrs and/or immediate prescription
14	**Patient age:** 7 months **Sex:** female **Presenting complaint:** cough for 5 days **Current asthma:** none **Vomiting:** parent reports moderate vomiting in the last 24hrs **Temperature:** parent reports severe fever in the last 24hrs **Wheeze:** present on examination **Inter/subcostal recession:** present on examination	high (5 risk factors present)	GP review within 24hrs and/or immediate prescription
15 †	**Patient age:** 1 year and 10 months **Sex:** female **Presenting complaint:** cough for 7 days **Current asthma:** present **Vomiting:** parent reports moderate vomiting in the last 24hrs **Temperature:** parent reports severe fever in the last 24hrs **Wheeze:** none **Inter/subcostal recession:** present on examination	high (5 risk factors present)	GP review within 24hrs and/or immediate prescription
16 †	**Patient age:** 1 year and 7 months **Sex:** female **Presenting complaint:** cough for 3 days **Current asthma:** present **Vomiting:** parent reports moderate vomiting in the last 24hrs **Temperature:** parent reports severe fever in the last 24hrs **Wheeze:** present on examination **Inter/subcostal recession:** present on examination	high (7 risk factors present)	GP review within 24hrs and/or immediate prescription

SET A: SURVEY 2			
Vignette identifier	Vignette Text	STARWAVe risk assessment	STARWAVe recommendation
17	**Patient age:** 2 years and 7 months **Sex:** male **Presenting complaint:** cough for 3 days **Current asthma:** none **Vomiting:** none **Temperature:** none **Wheeze:** none **Inter/subcostal recession:** none	very low (1 risk factor present)	no prescription
18	**Patient age:** 4 years and 7 months **Sex:** female **Presenting complaint:** cough for 7 days **Current asthma:** none **Vomiting:** none **Temperature:** none **Wheeze:** none **Inter/subcostal recession:** present on examination	very low (1 risk factor present)	no prescription
19	**Patient age:** 3 years and 4 months **Sex:** female **Presenting complaint:** cough for 3 days **Current asthma:** none **Vomiting:** parent reports moderate vomiting in the last 24hrs **Temperature:** parent reports severe fever in the last 24hrs **Wheeze:** none **Inter/subcostal recession:** none	normal (3 risk factors present)	no/delayed prescription
20	**Patient age:** 1 year **Sex:** male **Presenting complaint:** cough for 3 days **Current asthma:** none **Vomiting:** none **Temperature:** none **Wheeze:** present on examination **Inter/subcostal recession:** none	normal (3 risk factors present)	no/delayed prescription
21	**Patient age:** 1 year and 7 months **Sex:** female **Presenting complaint:** cough for 8 days **Current asthma:** present **Vomiting:** none **Temperature:** parent reports severe fever in the last 24hrs **Wheeze:** none **Inter/subcostal recession:** none	normal (3 risk factors present)	no/delayed prescription

22	**Patient age:** 1 year and 11 months **Sex:** female **Presenting complaint:** cough for 6 days **Current asthma:** present **Vomiting:** parent reports moderate vomiting in the last 24hrs **Temperature:** none **Wheeze:** none **Inter/subcostal recession:** none	normal (3 risk factors present)	no/delayed prescription
23	**Patient age:** 5 years and 7 months **Sex:** female **Presenting complaint:** cough for 3 days **Current asthma:** present **Vomiting:** none **Temperature:** none **Wheeze:** present on examination **Inter/subcostal recession:** none	normal (3 risk factors present)	no/delayed prescription
24	**Patient age:** 1 year and 3 months **Sex:** male **Presenting complaint:** cough for 1 day **Current asthma:** none **Vomiting:** none **Temperature:** none **Wheeze:** none **Inter/subcostal recession:** present on examination	normal (3 risk factors present)	no/delayed prescription
25	**Patient age:** 5 years and 8 months **Sex:** female **Presenting complaint:** cough for 5 days **Current asthma:** none **Vomiting:** none **Temperature:** parent reports severe fever in the last 24hrs **Wheeze:** present on examination **Inter/subcostal recession:** present on examination	normal (3 risk factors present)	no/delayed prescription
26	**Patient age:** 2 years and 7 months **Sex:** male **Presenting complaint:** cough for 4 days **Current asthma:** present **Vomiting:** none **Temperature:** parent reports severe fever in the last 24hrs **Wheeze:** none **Inter/subcostal recession:** present on examination	normal (3 risk factors present)	no/delayed prescription
27	**Patient age:** 4 months **Sex:** male **Presenting complaint:** cough for 3 days **Current asthma:** present **Vomiting:** none **Temperature:** parent reports severe fever in the last 24hrs **Wheeze:** present on examination **Inter/subcostal recession:** none	high (5 risk factors present)	GP review within 24hrs and/or immediate prescription

28	**Patient age:** 8 months **Sex:** male **Presenting complaint:** cough for 3 days **Current asthma:** none **Vomiting:** parent reports moderate vomiting in the last 24hrs **Temperature:** parent reports severe fever in the last 24hrs **Wheeze:** none **Inter/subcostal recession:** present on examination	high (5 risk factors present)	GP review within 24hrs and/or immediate prescription
29	**Patient age:** 7 months **Sex:** male **Presenting complaint:** cough for 2 days **Current asthma:** none **Vomiting:** parent reports moderate vomiting in the last 24hrs **Temperature:** none **Wheeze:** present on examination **Inter/subcostal recession:** present on examination	high (5 risk factors present)	GP review within 24hrs and/or immediate prescription
30 †	**Patient age:** 8 months **Sex:** male **Presenting complaint:** cough for 2 days **Current asthma:** present **Vomiting:** none **Temperature:** parent reports severe fever in the last 24hrs **Wheeze:** none **Inter/subcostal recession:** present on examination	high (5 risk factors present)	GP review within 24hrs and/or immediate prescription
31 †	**Patient age:** 1 year and 6 months **Sex:** female **Presenting complaint:** cough for 3 days **Current asthma:** present **Vomiting:** parent reports severe vomiting in the last 24hrs **Temperature:** none **Wheeze:** none **Inter/subcostal recession:** present on examination	high (5 risk factors present)	GP review within 24hrs and/or immediate prescription
32 †	**Patient age:** 3 years and 8 months **Sex:** female **Presenting complaint:** cough for 7 days **Current asthma:** present **Vomiting:** parent reports moderate vomiting in the last 24hrs **Temperature:** parent reports severe fever in the last 24hrs **Wheeze:** present on examination **Inter/subcostal recession:** present on examination	high (5 risk factors present)	GP review within 24hrs and/or immediate prescription

SET B: SURVEY 1			
Vignette identifier	Vignette Text	STARWAVe risk assessment	STARWAVe recommendation
33	**Patient age:** 1 year and 10 months **Sex:** male **Presenting complaint:** cough for 7 days **Current asthma:** none **Vomiting:** none **Temperature:** none **Wheeze:** none **Inter/subcostal recession:** none	very low (1 risk factor present)	no prescription
34	**Patient age:** 1 year and 4 months **Sex:** female **Presenting complaint:** cough for 5 days **Current asthma:** none **Vomiting:** parent reports moderate vomiting in the last 24hrs **Temperature:** parent reports severe fever in the last 24hrs **Wheeze:** none **Inter/subcostal recession:** none	normal (3 risk factors present)	no/delayed prescription
35	**Patient age:** 4 years and 11 months **Sex:** male **Presenting complaint:** cough for 3 days **Current asthma:** none **Vomiting:** none **Temperature:** parent reports severe fever in the last 24hrs **Wheeze:** present on examination **Inter/subcostal recession:** none	normal (3 risk factors present)	no/delayed prescription
36	**Patient age:** 4 years and 5 months **Sex:** male **Presenting complaint:** cough for 3 days **Current asthma:** none **Vomiting:** parent reports moderate vomiting in the last 24hrs **Temperature:** none **Wheeze:** present on examination **Inter/subcostal recession:** none	normal (3 risk factors present)	no/delayed prescription
37	**Patient age:** 5 years and 9 months **Sex:** male **Presenting complaint:** cough for 4 days **Current asthma:** present **Vomiting:** parent reports moderate vomiting in the last 24hrs **Temperature:** parent reports severe fever in the last 24hrs **Wheeze:** none **Inter/subcostal recession:** none	normal (3 risk factors present)	no/delayed prescription

38	**Patient age:** 1 year and 9 months **Sex:** female **Presenting complaint:** cough for 5 days **Current asthma:** present **Vomiting:** none **Temperature:** none **Wheeze:** present on examination **Inter/subcostal recession:** none	normal (3 risk factors present)	no/delayed prescription
39	**Patient age:** 4 years **Sex:** female **Presenting complaint:** cough for 3 days **Current asthma:** none **Vomiting:** none **Temperature:** parent reports severe fever in the last 24hrs **Wheeze:** none **Inter/subcostal recession:** present on examination	normal (3 risk factors present)	no/delayed prescription
40 †	**Patient age:** 3 years and 3 months **Sex:** female **Presenting complaint:** cough for 3 days **Current asthma:** none **Vomiting:** parent reports moderate vomiting in the last 24hrs **Temperature:** none **Wheeze:** none **Inter/subcostal recession:** present on examination	normal (3 risk factors present)	no/delayed prescription
41	**Patient age:** 4 years and 6 months **Sex:** female **Presenting complaint:** cough for 10 days **Current asthma:** none **Vomiting:** parent reports moderate vomiting in the last 24hrs **Temperature:** none **Wheeze:** present on examination **Inter/subcostal recession:** present on examination	normal (3 risk factors present)	no/delayed prescription
42	**Patient age:** 4 years and 5 months **Sex:** male **Presenting complaint:** cough for 21 days **Current asthma:** present **Vomiting:** parent reports moderate vomiting in the last 24hrs **Temperature:** none **Wheeze:** none **Inter/subcostal recession:** present on examination	normal (3 risk factors present)	no/delayed prescription

43	**Patient age:** 1 year **Sex:** male **Presenting complaint:** cough for 2 days **Current asthma:** present **Vomiting:** parent reports moderate vomiting in the last 24hrs **Temperature:** parent reports severe fever in the last 24hrs **Wheeze:** none **Inter/subcostal recession:** none	high (5 risk factors present)	GP review within 24hrs and/or immediate prescription
44 †	**Patient age:** 1 year and 9 months **Sex:** male **Presenting complaint:** cough for 3 days **Current asthma:** present **Vomiting:** parent reports severe vomiting in the last 24hrs **Temperature:** none **Wheeze:** present on examination **Inter/subcostal recession:** none	high (5 risk factors present)	GP review within 24hrs and/or immediate prescription
45	**Patient age:** 2 years and 10 months **Sex:** male **Presenting complaint:** cough for 1 day **Current asthma:** none **Vomiting:** parent reports moderate vomiting in the last 24hrs **Temperature:** parent reports severe fever in the last 24hrs **Wheeze:** present on examination **Inter/subcostal recession:** present on examination	high (5 risk factors present)	GP review within 24hrs and/or immediate prescription
46	**Patient age:** 1 year and 7 months **Sex:** female **Presenting complaint:** cough for 4 days **Current asthma:** present **Vomiting:** none **Temperature:** parent reports severe fever in the last 24hrs **Wheeze:** present on examination **Inter/subcostal recession:** present on examination	high (5 risk factors present)	GP review within 24hrs and/or immediate prescription
47	**Patient age:** 1 year and 8 months **Sex:** male **Presenting complaint:** cough for 1 day **Current asthma:** present **Vomiting:** none **Temperature:** none **Wheeze:** present on examination **Inter/subcostal recession:** present on examination	high (5 risk factors present)	GP review within 24hrs and/or immediate prescription

48	**Patient age:** 1 year and 8 months **Sex:** female **Presenting complaint:** cough for 14 days **Current asthma:** present **Vomiting:** parent reports moderate vomiting in the last 24hrs **Temperature:** none **Wheeze:** present on examination **Inter/subcostal recession:** present on examination	high (5 risk factors present)	GP review within 24hrs and/or immediate prescription

SET B: SURVEY 2			
Vignette identifier	Vignette Text	STARWAVe risk assessment	STARWAVe recommendation
49	**Patient age:** 5 years and 3 months **Sex:** female **Presenting complaint:** cough for 7 days **Current asthma:** none **Vomiting:** parent reports moderate vomiting in the last 24hrs **Temperature:** none **Wheeze:** none **Inter/subcostal recession:** none	very low (1 risk factor present)	no prescription
50	**Patient age:** 2 years and 1 month **Sex:** male **Presenting complaint:** cough for 8 days **Current asthma:** present **Vomiting:** none **Temperature:** none **Wheeze:** none **Inter/subcostal recession:** none	very low (1 risk factor present)	no prescription
51	**Patient age:** 1 year and 3 months **Sex:** female **Presenting complaint:** cough for 2 days **Current asthma:** none **Vomiting:** parent reports moderate vomiting in the last 24hrs **Temperature:** none **Wheeze:** none **Inter/subcostal recession:** none	normal (3 risk factors present)	no/delayed prescription
52	**Patient age:** 3 years **Sex:** male **Presenting complaint:** cough for 7 days **Current asthma:** none **Vomiting:** parent reports moderate vomiting in the last 24hrs **Temperature:** parent reports severe fever in the last 24hrs **Wheeze:** present on examination **Inter/subcostal recession:** none	normal (3 risk factors present)	no/delayed prescription

53	**Patient age:** 3 years and 10 months **Sex:** male **Presenting complaint:** cough for 3 days **Current asthma:** present **Vomiting:** none **Temperature:** parent reports severe fever in the last 24hrs **Wheeze:** none **Inter/subcostal recession:** none	normal (3 risk factors present)	no/delayed prescription
54	**Patient age:** 3 years and 10 months **Sex:** female **Presenting complaint:** cough for 3 days **Current asthma:** present **Vomiting:** parent reports moderate vomiting in the last 24hrs **Temperature:** none **Wheeze:** none **Inter/subcostal recession:** none	normal (3 risk factors present)	no/delayed prescription
55	**Patient age:** 5 years and 6 months **Sex:** male **Presenting complaint:** cough for 7 days **Current asthma:** present **Vomiting:** parent reports severe vomiting in the last 24hrs **Temperature:** none **Wheeze:** present on examination **Inter/subcostal recession:** none	normal (3 risk factors present)	no/delayed prescription
56	**Patient age:** 4 years and 5 months **Sex:** female **Presenting complaint:** cough for 7 days **Current asthma:** none **Vomiting:** parent reports moderate vomiting in the last 24hrs **Temperature:** parent reports severe fever in the last 24hrs **Wheeze:** none **Inter/subcostal recession:** present on examination	normal (3 risk factors present)	no/delayed prescription
57	**Patient age:** 1 year and 5 months **Sex:** male **Presenting complaint:** cough for 4 days **Current asthma:** none **Vomiting:** none **Temperature:** none **Wheeze:** present on examination **Inter/subcostal recession:** present on examination	normal (3 risk factors present)	no/delayed prescription

58 †	**Patient age:** 1 year and 2 months **Sex:** female **Presenting complaint:** cough for 14 days **Current asthma:** present **Vomiting:** none **Temperature:** none **Wheeze:** none **Inter/subcostal recession:** present on examination	normal (3 risk factors present)	no/delayed prescription
59	**Patient age:** 2 years and 6 months **Sex:** female **Presenting complaint:** cough for 7 days **Current asthma:** present **Vomiting:** none **Temperature:** none **Wheeze:** present on examination **Inter/subcostal recession:** present on examination	normal (3 risk factors present)	no/delayed prescription
60	**Patient age:** 1 year and 11 months **Sex:** male **Presenting complaint:** cough for 11 days **Current asthma:** present **Vomiting:** parent reports moderate vomiting in the last 24hrs **Temperature:** parent reports severe fever in the last 24hrs **Wheeze:** present on examination **Inter/subcostal recession:** none	high (5 risk factors present)	GP review within 24hrs and/or immediate prescription
61	**Patient age:** 1 year and 5 months **Sex:** female **Presenting complaint:** cough for 2 days **Current asthma:** none **Vomiting:** none **Temperature:** parent reports severe fever in the last 24hrs **Wheeze:** present on examination **Inter/subcostal recession:** present on examination	high (5 risk factors present)	GP review within 24hrs and/or immediate prescription
62	**Patient age:** 4 years and 3 months **Sex:** male **Presenting complaint:** cough for 2 days **Current asthma:** present **Vomiting:** parent reports moderate vomiting in the last 24hrs **Temperature:** parent reports severe fever in the last 24hrs **Wheeze:** none **Inter/subcostal recession:** present on examination	high (5 risk factors present)	GP review within 24hrs and/or immediate prescription

63	**Patient age:** 4 years and 7 months **Sex:** female **Presenting complaint:** cough for 3 days **Current asthma:** present **Vomiting:** none **Temperature:** parent reports severe fever in the last 24hrs **Wheeze:** present on examination **Inter/subcostal recession:** present on examination	high (5 risk factors present)	GP review within 24hrs and/or immediate prescription
64	**Patient age:** 2 years and 2 months **Sex:** male **Presenting complaint:** cough for 2 days **Current asthma:** present **Vomiting:** parent reports moderate vomiting in the last 24hrs **Temperature:** none **Wheeze:** present on examination **Inter/subcostal recession:** present on examination	high (5 risk factors present)	GP review within 24hrs and/or immediate prescription

Note: We have underlined the STARWAVe risk factors that are present in each case, for salience. They were not underlined when vignettes were presented to GPs. In constructing the vignettes, we aimed to maximise both internal and external validity. Internal validity was secured by varying the STARWAVe factors in a factorial design; external validity was secured by "matching" vignettes to real patients that had participated in the STARWAVe cohort study (these data were provided by the University of Bristol's Research Data Service, upon request). More specifically: per vignette, we identified a STARWAVe patient that presented with the same STARWAVe profile and used his/her details (e.g., age, illness duration) to construct the case. Eighty six per cent of vignettes (55/64) were successfully "matched" to real STARWAVe patients; nine could not be matched and are thus fictitious.

† This vignette could not be "matched" to a STARWAVe patient and is thus fictitious.

TABLE S2: DISTRIBUTION OF RISK ACROSS SETS AND SURVEYS

	SET A (32 vignettes)		SET B (32 vignettes)		Total
	Survey 1	Survey 2	Survey 1	Survey 2	
Very low risk	2	2	1	2	7
Normal risk	9	8	9	9	35
High risk	5	6	6	5	22
Total	16	16	16	16	64

Each GP was randomly assigned to either set A or set B. GPs assigned to set A saw the 16 light blue vignettes and the 16 dark blue vignettes, in two separate surveys administered 24 hours apart. Half of these GPs (selected at random) saw survey 1 first; the other half saw survey 2 first. Similarly, GPs assigned to set B saw the 16 light green vignettes and the 16 dark green vignettes, in two separate surveys administered 24 hours apart, with survey order counterbalanced across GPs.

TABLE S3: PARENTAL CONCERN VIGNETTES

Vignette identifier	Vignette Text	STARWAVe risk assessment	STARWAVe recommendation
1	**Patient age:** 4 years and 5 months **Sex:** male **Presenting complaint:** cough for 6 days **Current asthma:** none **Vomiting:** none **Temperature:** parent reports severe fever in the last 24hrs **Wheeze:** none **Inter/subcostal recession:** none **Other:** the parent is quite concerned	very low (1 risk factor present)	no prescription
2	**Patient age:** 2 years and 4 months **Sex:** female **Presenting complaint:** cough for 6 days **Current asthma:** none **Vomiting:** none **Temperature:** none **Wheeze:** present on examination **Inter/subcostal recession:** none **Other:** the parent is quite concerned	very low (1 risk factor present)	no prescription
17	**Patient age:** 2 years and 7 months **Sex:** male **Presenting complaint:** cough for 3 days **Current asthma:** none **Vomiting:** none **Temperature:** none **Wheeze:** none **Inter/subcostal recession:** none **Other:** the parent is quite concerned	very low (1 risk factor present)	no prescription
18	**Patient age:** 4 years and 7 months **Sex:** female **Presenting complaint:** cough for 7 days **Current asthma:** none **Vomiting:** none **Temperature:** none **Wheeze:** none **Inter/subcostal recession:** present on examination **Other:** the parent is quite concerned	very low (1 risk factor present)	no prescription
33	**Patient age:** 1 year and 10 months **Sex:** male **Presenting complaint:** cough for 7 days **Current asthma:** none **Vomiting:** none **Temperature:** none **Wheeze:** none **Inter/subcostal recession:** none **Other:** the parent is quite concerned	very low (1 risk factor present)	no prescription

49	**Patient age:** 5 years and 3 months **Sex:** female **Presenting complaint:** cough for 7 days **Current asthma:** none **Vomiting:** parent reports moderate vomiting in the last 24hrs **Temperature:** none **Wheeze:** none **Inter/subcostal recession:** none **Other:** the parent is quite concerned	very low (1 risk factor present)	no prescription
50	**Patient age:** 2 years and 1 month **Sex:** male **Presenting complaint:** cough for 8 days **Current asthma:** present **Vomiting:** none **Temperature:** none **Wheeze:** none **Inter/subcostal recession:** none **Other:** the parent is quite concerned	very low (1 risk factor present)	no prescription

Note: We have underlined the STARWAVe risk factors that are present in each case, for salience. They were not underlined when vignettes were presented to GPs.

APPENDIX S1: EXPRESSION OF INTEREST FORM

Please enter your NHS e-mail address.
Note: you will need to use this e-mail address to log in to the study website.

_____

Please confirm your NHS e-mail address.

_____

What is your gender?

- ○ Male
- ○ Female
- ○ Non-binary
- ○ Prefer not to say

What year did you qualify as a GP?

_____

Do you have a Diploma in Child Health?

- ○ Yes
- ○ No

Are you a member/fellow of the Royal College of Paediatrics and Child Health?

- ○ Yes, I am a member/fellow
- ○ No, I am not a member/fellow

How confident do you feel when assessing sick children?

- ○ I seldom feel confident
- ○ I feel confident sometimes
- ○ I feel confident most of the time
- ○ I always feel confident

APPENDIX S2: INTRODUCTION TO THE STUDY

You will now read 16 brief clinical vignettes, describing **children presenting with cough.**

[GPs then saw one of the following two paragraphs, depending on the risk response mode to which they were assigned.]

[For those assigned to provide their own numeric estimate of risk on a sliding scale (%):]
For each vignette, you will be asked to assess the patient's **risk of deterioration** (specifically, the probability that they will be hospitalised for RTI within 1 month). You will be asked to express your answer as a percentage, on a sliding scale ranging from 0% (minimum) to 20% (maximum). The scale is capped at 20% because most of the children presenting to your practice with cough and RTI symptoms have a very low probability of hospitalisation: typically, it is **less than 2%** and rarely exceeds 17%. However, bear in mind that the selection of cases that you will see here is not necessarily representative of the population that you see in your practice.

[For those assigned to select between three risk categories:]
For each vignette, you will be asked to assess the patient's **risk of deterioration** (specifically, the probability that they will be hospitalised for RTI within 1 month), by selecting between three risk categories:

- extremely low (around 0.3%)
- low (around 1.5%)
- moderate or high (around 7% and above)

Most of the children presenting to your practice with cough and RTI symptoms fall into one of these three categories. Typically, the probability of hospitalisation is **less than 2%** (i.e., "extremely low" or "low") and rarely exceeds 17% (therefore 7%+ is considered "moderate or high"). However, bear in mind that the selection of cases that you will see here is not necessarily representative of the population that you see in your practice.

[The following was then displayed to all participants:]
After providing your risk assessment, you will be asked how you would **manage the patient.** There will be three options available for patient management:

- prescribe antibiotics
- arrange to GP review within 24 hours
- admit for paediatric assessment

You may tick all that apply (or none, if none apply).

Thank you once again for taking part!

APPENDIX S3: PILOT STUDY

We conducted a pilot study to understand how GPs would describe STARWAVe's three levels of risk. Using a method described by Juanchich and colleagues,[1-3] we presented GP participants with three hypothetical patient cases in a random order, online. Each case contained only two items of information:
1) a brief description of the patient (a child presenting with RTI symptoms); and
2) the probability that the child would be hospitalised for RTI within a month (presented as the output of a decision aid).
The probability of hospitalisation in the three cases was 0.3% ("very low" according to STARWAVe), 1.5% ("normal" according to STARWAVe) and 11.8% ("high" according to STARWAVe), respectively. Per case, GPs selected (from the following list) the phrase that best described the stated probability: "extremely low", "very low", "low", "moderate", "high", "very high", "extremely high".

Eighty-one GPs accessed the survey; of these, 47 completed it. The most commonly-selected phrases were:

- 0.3%: "extremely low" (57%, 27/47) and "very low" (30%, 14/47)
- 1.5%: "very low" (43%, 20/47) and "low" (36%, 17/47)
- 11.8%: "moderate" (34%, 16/47) and "high" (26%, 12/47)

We used the most commonly-selected phrase per probability to construct following response scale:

- extremely low (around 0.3%)
- very low (around 1.5%)
- moderate (around 12%)

We perceived this scale to be incomplete, given that there is no category for "low" and no category for "high". To rectify this, we made two adjustments:
1) We changed the middle category (1.5%) from "very low" to "low", which was chosen with similar frequency (*n* very low=20 vs. *n* low=17);
2) We changed the upper category (12%) from "moderate" to "moderate or high", because most GPs deemed this probability to be moderate or higher (*n*=35, 74%).

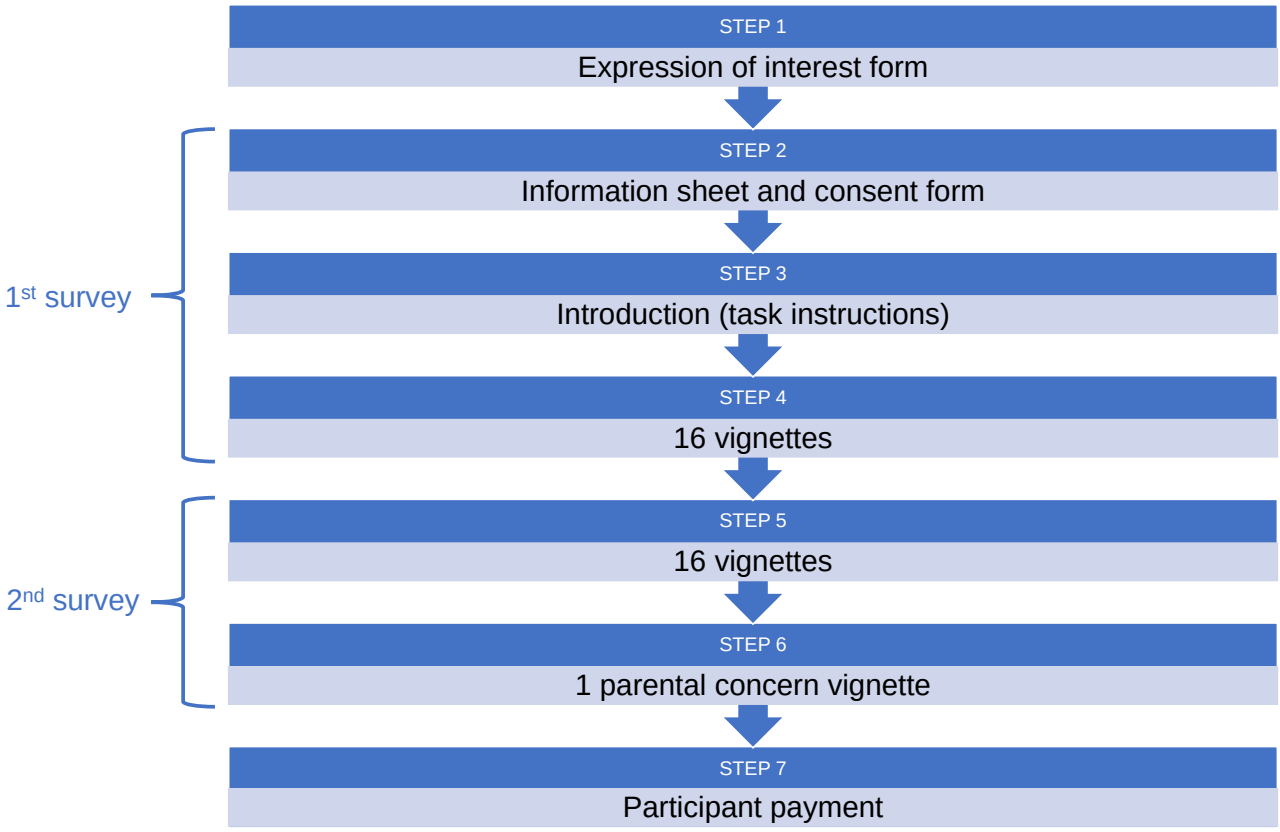
This returned the following response scale:

- extremely low (around 0.3%)
- low (around 1.5%)
- moderate or high (around 12% and above)

We were more satisfied with this scale, but perceived the starting point for "moderate or high" (12%) to be too restrictive: in STARWAVe, the confidence interval for this category is wide (95% CI 7.3-16.2%). We therefore reduced the starting point for this category to 7%, in line with STARWAVe. This returned the final response scale, intended for use in the present study:

- extremely low (around 0.3%)
- low (around 1.5%)
- moderate or high (around 7% and above)

FIGURE S1: STUDY PROCEDURE


STEP 1
Expression of interest form
STEP 2
Information sheet and consent form
STEP 3
Introduction (task instructions)
STEP 4
16 vignettes
1st survey
STEP 5
16 vignettes
STEP 6
1 parental concern vignette
2nd survey
STEP 7
Participant payment

APPENDIX S4: DEPARTURES FROM APPROVED PROTOCOL

The following changes were made to the methods as described in our approved protocol:

1) Our original recruitment strategy, described on page 16 of the protocol, was to (a) invite GPs that had participated in our previous studies; (b) ask the NIHR-CRN to circulate an invitation e-mail to GP practices across England; and (c) encourage GPs to forward the invitation e-mail to their colleagues. In the end, all participants were recruited via the NIHR-CRN; we did not invite previous study participants or ask GPs to invite their colleagues. This is because the NIHR-CRN kindly offered to pay an additional £50 to the practice of any GP that they recruited, and we did not wish to have different reimbursement structures in place for different participants. Inclusion in the NIHR-CRN portfolio requires HRA approval, therefore this was obtained (ref 21/HRA/0958).

2) Due to word constraints, the final article does not include the "Additional Analyses" described on page 15 of the protocol. The purpose of these analyses was to explore whether/how GP variables (years of experience, gender, Diploma in Child Health, membership with the Royal College of Paediatrics & Child Health, confidence when assessing sick children) might relate to key outcome variables (risk assessments and prescribing decisions). These analyses were supplementary (unrelated to our primary/secondary research questions) and therefore we felt comfortable excluding them.

3) We were not able to adhere to our proposed timeline, described on page 17 of the protocol. This was due to the challenges of recruiting GPs during a pandemic (COVID-19).

APPENDIX S5: POWER ANALYSIS PER HYPOTHESIS

Per-hypothesis power analyses are shown in the Table below. Each power analysis comprises 1) a G*Power 3.1 sample size calculation, which indicates the number of independent responses required, and 2) a 'design effect' (DE) adjustment, which accounts for the clustering of responses per GP. The design effect was computed using the formula $DE=1+(n-1)\,\rho$,[4,5] where n is the cluster size (i.e., the number of responses per GP) and ρ the intraclass correlation coefficient from a previous study (ICC). Multiplying the DE by the number of independent responses required (i.e., the required N according to G*Power) returned the number of clustered responses required. Dividing the number of clustered responses required by the cluster size (i.e., the number of responses per GP) returned the number of GPs required for the test in question.

As the Table shows, 429 GPs were needed to assess the effect of the STARWAVe factors on categorical risk assessments (i.e., risk assessments cast by selecting between three risk categories; row 1, critical test *a*). GPs are a difficult-to-reach population, therefore this figure was unrealistic. We could however assess the effect of the STARWAVe factors on continuous risk assessments (i.e., risk assessments cast on a 0-20% sliding scale), with only 88 GPs (row 1, critical test *b*). The remaining two analyses required 140 and 134 GPs respectively (rows 2 and 3); therefore, we deemed it practical to recruit two groups of 88 GPs (N=176 in total): group 1 would use the continuous risk response scale, group 2 would use the categorical risk response scale, and all GPs would be included in remaining two analyses. Analyses involving the categorical risk response scale would be underpowered and therefore exploratory; findings will require confirmation in a larger study. Assuming a dropout rate of 2% (higher than the rate observed in our previous study[6] – which was 1% – given the current COVID-19 pandemic), we aimed to recruit an additional four GPs (2 per risk response scale), yielding n=90 per risk response scale and N=180 in total.

Research question	Hypothesis	Test	Power analysis
1) To what extent do GPs' risk assessments reflect the STARWAVe CPR?	We hypothesised a full replication of our previous findings.[6] Specifically: presence of vomiting, presence of wheeze, and younger patient age would each increase risk assessments (consistent with STARWAVe); a shorter illness duration would decrease them (inconsistent with STARWAVe). (We had no hypotheses in regards temperature, asthma and recession, which were not investigated in the previous study.)	a) *GPs who selected between 3 risk categories:* A mixed-effects ordinal logistic regression of risk assessments (0=*level 1*, 1=*level 2*, 2=*level 3*) on the 7 STARWAVe factors. b) *GPs who estimated risk on a 0-20% sliding scale:* A mixed-effects linear regression of risk assessments (continuous) on the 7 STARWAVe factors.	a) According to G*Power, 1,075 responses were needed to detect an OR of 1.49 (the smallest significant effect identified in our previous study, where we conducted a comparable analysis[6]) in a 2-tailed logistic regression, given power at 90% and alpha at 0.05. Assuming 32 responses per GP and an ICC of 0.38 (obtained from our previous study[6]), the DE was 12.78. Adjusting the G*Power sample size (1,075) by this DE (12.78) called for 13,739 responses (1,075 x 12.78 = 13,739). At 32 responses per GP, **429 GPs** were required (13,739 ÷ 32 = 429). b) According to G*Power, 528 responses were needed to detect a small effect (f^2 0.02) in a 2-tailed multiple linear regression, given power at 90% and alpha at 0.05. Assuming 32 responses per GP and an ICC of 0.14 (obtained from a current study by our research team, wherein *N* = 314 GPs estimated risk of cancer in 20 patient vignettes[‡]), the DE was 5.34. Adjusting the G*Power sample size (528) by this DE (5.34) called for 2,820 responses (528 x 5.34 = 2,820). At 32 responses per GP, **88 GPs** were required (2,820 ÷ 32 = 88).

2) To what extent do GPs' antibiotic prescribing decisions reflect the STARWAVe CPR?	We hypothesised a full replication of our previous findings.[6] Specifically: presence of vomiting and presence of wheeze would each increase prescribing odds (consistent with STARWAVe); patient age would not affect them; and a shorter illness duration would decrease them (inconsistent with STARWAVe). (We had no hypotheses in regards temperature, asthma and recession.)	*All GPs:* A mixed-effects binary logistic regression of prescribing decisions (0=no/delayed prescription, 1=immediate prescription) on the 7 STARWAVe factors.	According to G*Power, 299 responses were needed to detect an OR of 2.17 (the smallest significant effect identified in a comparable analysis in our previous study[6]) in a 2-tailed logistic regression, given power at 90% and alpha at 0.05. Assuming 32 responses per GP and an ICC of 0.45 (obtained from our previous study[6]), the DE was 14.95. Adjusting the G*Power sample size (299) by this DE (14.95) called for 4,470 responses (299 x 14.95 = 4,470). At 32 responses per GP, **140 GPs** were required (4,470 ÷ 32 = 140).
3) What is the effect of parental concern on GPs' antibiotic prescribing decisions?	We hypothesised that prescribing odds would increase when a statement indicating that "the parent is quite concerned" was present (vs. absent) from a *level 1* risk case. (We had no hypotheses as to whether/how parental concern might influence GPs' risk assessments.)	*All GPs, level 1 cases only:* A mixed-effects binary logistic regression of prescribing decisions (0=no/delayed prescription, 1=immediate prescription) on parental concern (0=absent, 1=present).	According to G*Power, 258 responses were needed to detect an OR of 2.31 (the effect identified in a previous study of patient/parent expectations for antibiotics on GP prescribing behaviour[7]) in a 2-tailed logistic regression, given power at 90% and alpha at 0.05. Assuming 8 responses per GP (1 with and 7 without parental concern) and an ICC of 0.45 (obtained from our previous study[6]), the DE was 4.15. Adjusting the G*Power sample size (258) by this DE (4.15) called for 1,071 responses (258 x 4.15 = 1,071). At 8 responses per GP, **134 GPs** were required (1,071 ÷ 8 = 134).

‡ personal communication with the Principal Investigator (Dr Olga Kostopoulou) on 29 October 2020.

TABLE S4: AGE AND DURATION AS BINARY

Factor	**Sliding scale *b* [95% CI]**	**Categorical selection *OR* [95% CI]**	**Immediate prescription *OR* [95% CI]**
Short duration (≤3 days)	-0.30* [-0.58, -0.02]	0.80* [0.68, 0.96]	0.22** [0.16, 0.30]
Temperature	2.42** [2.05, 2.78]	5.22** [4.04, 6.74]	5.22** [3.93, 6.93]
Age (<2 years)	0.87** [0.58, 1.17]	1.75** [1.46, 2.08]	0.70** [0.58, 0.84]
Recession	5.39** [4.87, 5.91]	60.34** [42.49, 85.68]	0.48** [0.36, 0.65]
Wheeze	2.39** [2.09, 2.69]	6.54** [5.10, 8.37]	0.85 [0.68, 1.05]
Asthma	0.66** [0.42, 0.90]	2.07** [1.74, 2.47]	1.22 [0.99, 1.50]
Vomiting	1.71** [1.41, 2.02]	3.29** [2.65, 4.08]	0.97 [0.78, 1.20]

**$p \leq .001$. *$p \leq .05$. Age and duration are treated as binary (age=1 if <2 years; duration=1 if ≤3 days; otherwise 0). As in the main text (Table 3), the model for the sliding scale group included random slopes for all seven STARWAVe factors; the model for the category selection group included random slopes for four STARWAVe factors (recession, temperature, wheeze, vomiting); and the model for immediate prescriptions included random slopes for all STARWAVe factors except age.

APPENDIX S6: SELECTING RANDOM SLOPES FOR THE "CATEGORY SELECTION" MODEL (Table 3 in the main text)

To measure the effect of the seven STARWAVe factors on categorical risk assessments, we used a mixed-effects ordinal logistic regression model with a per-participant random intercept. When we added random slopes for all seven STARWAVe factors, the model would not converge. Suspecting that this was due to model overload, we aimed to identify the random slopes that best improved model fit and include as many of these as possible in the model.

To this end, we constructed a "baseline" model: categorical risk assessments (0=*level 1*, 1=*level 2*, 2=*level 3*) were regressed on the seven STARWAVe factors in a mixed-effects ordinal logistic regression with a by-participant random intercept and no random slopes. In this model, Akaike's Information Criterion (AIC) was 4097.02 and Bayesian Information Criterion (BIC) was 4157.11.

We then repeated this model 7 times. In each repeat, one (and only one) of the seven STARWAVe factors was given a random slope. We measured AIC and BIC after each repeat and ranked them in order of "importance"; i.e., best-to-worst effect on model fit.

A random slope for recession had the best effect on model fit, reducing both AIC (4045.92) and BIC (4112.02). A random slope for temperature had the second-best effect (AIC=4074.37, BIC=4140.47). Random slopes for wheeze (AIC=4086.50, BIC=4152.60), vomiting (AIC=4095.92, BIC=4162.01), age (AIC=4097.50, BIC=4163.60) and duration (AIC=4101.03, BIC=4167.13) had progressively smaller effects, while a random slope for asthma would not converge. We therefore added random slopes for recession, temperature, wheeze, and vomiting (adding random slopes for age, illness duration, and/or asthma either worsened model fit or failed to converge). The AIC in this final model was 4001.60 and the BIC was 4085.73.

APPENDIX S7: TESTING THE PROPORTIONAL ODDS ASSUMPTION IN THE "CATEGORICAL SELECTION" MODEL (Table 3 in the main text)

Statistical tests of the proportional odds assumption revealed that four variables met it ($p_{temperature}$=0.117, p_{age}=0.595, $p_{recession}$=0.561, p_{asthma}=0.127) and three did not ($p_{duration}$=0.042, p_{wheeze}=0.029, p_{vomit}=0.017). That is, the respective effects of age, recession, temperature, and asthma were consistent for successive levels of the ordinal dependent variable, while those of duration, vomiting, and wheeze were not. We therefore constructed a partial proportional odds (PPO) model, where four coefficients were fixed (temperature, age, recession, asthma) and three were allowed to vary (duration, wheeze, vomiting).

The results appear below. The model progresses in two steps: the first step compares responses of "extremely low, around 0.3%" (i.e. *level 1*, here coded 0) to responses of "low, around 1.5%" (*level 2*) and "moderate or high, around 7% and above" (*level 3*, both coded 1). The second step compares *level 1* and *level 2* (both coded 0) to *level 3* (coded 1).

Trends were consistent across steps, and consistent with those reported in the main text. The effects of duration, wheeze, and vomiting (the three coefficients that were allowed to vary) reduced from step 1 to step 2.

	STEP 1: ***level 1* (coded 0) vs. *level 2/3* (coded 1)** ***OR* [95% CI]**	**STEP 2:** ***level 1/2* (coded 0) vs. *level 3* (coded 1)** ***OR* [95% CI]**
Duration (ascending)	1.07** [1.03, 1.12]	1.02† [1.00, 1.05]
Temperature	3.63** [2.94, 4.48]	3.63** [2.94, 4.48]
Age (ascending)	0.89** [0.84, 0.94]	0.89** [0.84, 0.94]
Recession	20.23** [15.10, 27.10]	20.23** [15.10, 27.10]
Wheeze	5.14** [3.77, 7.02]	3.63** [2.87, 4.59]
Asthma	1.74** [1.51, 2.01]	1.74** [1.51, 2.01]
Vomiting	3.06** [2.34, 4.02]	2.19** [1.80, 2.67]

**$p<0.01$. †p=0.078. Age and duration were treated as continuous in this model. Step 2 of the model (*level 1/2* vs. *level 3*) is akin to the model reported in the main text; differences in coefficients may be attributed to different estimation procedures (e.g., the ordinal model estimates all parameters simultaneously).[8]

APPENDIX S8: SELECTING RANDOM SLOPES FOR THE "PRESCRIPTIONS" MODEL (Table 3 in the main text)

To measure the effect of the seven STARWAVe factors on immediate prescriptions, we used a mixed-effects binary logistic regression model with a per-participant random intercept. When we added random slopes for all seven STARWAVe factors, the model would not converge. We therefore identified the random slopes that best improved model fit, with a view to including as many of these as possible.

To this end, we constructed a "baseline" model: immediate prescriptions (0=no prescription/delayed prescription, 1=immediate prescription) were regressed upon the seven STARWAVe factors in a mixed-effects binary logistic regression with a by-participant random intercept and no random slopes. In this model, Akaike's Information Criterion (AIC) was 3873.15 and Bayesian Information Criterion (BIC) was 3933.47.

We then repeated this model 7 times; in each repeat, one of the seven STARWAVe factors was given a random slope. We measured AIC and BIC after each repeat and ranked them in order of "importance"; i.e., best-to-worst effect on model fit.

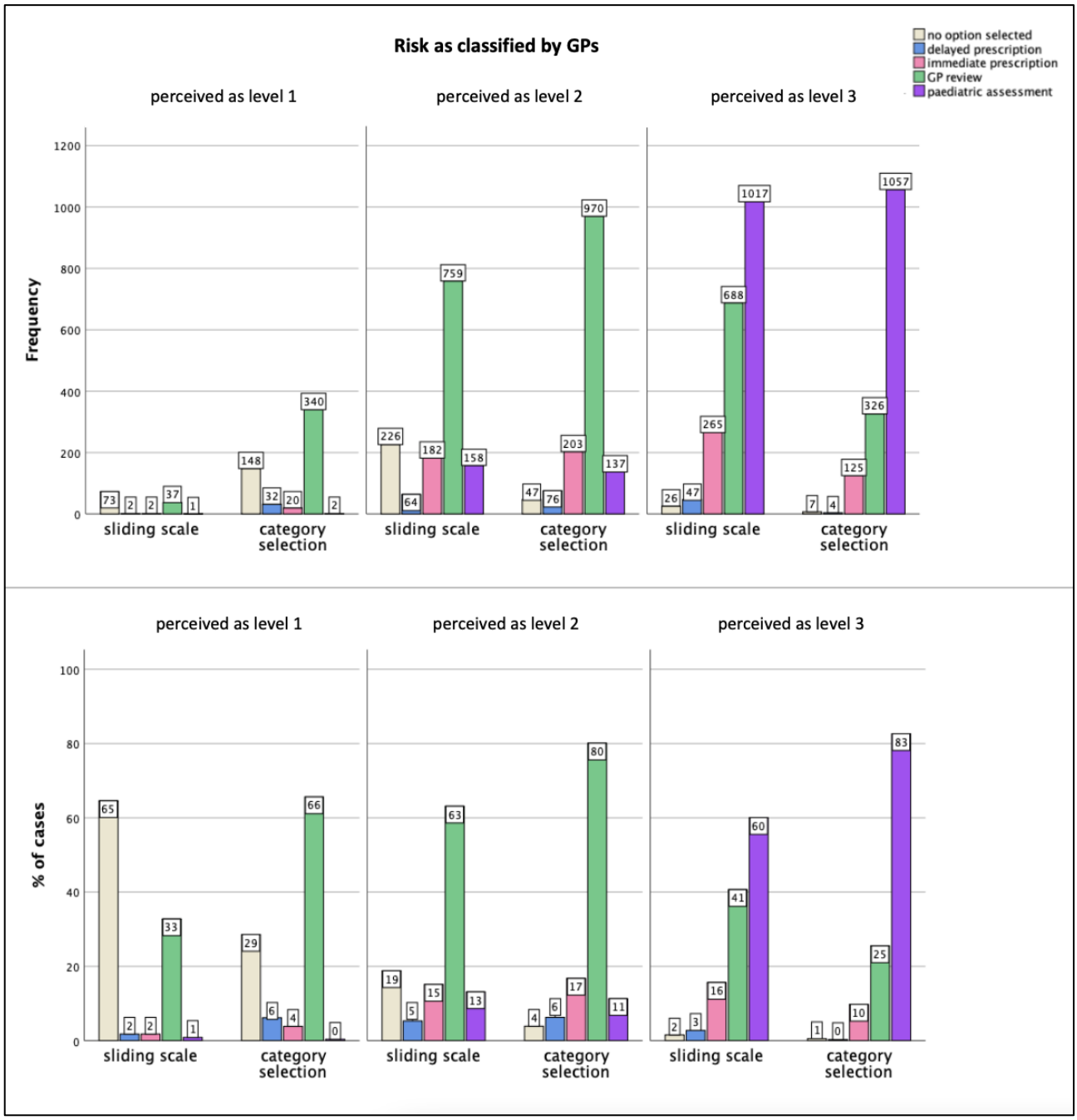
A random slope for recession had the best effect on model fit, reducing both AIC (3821.65) and BIC (3888.68). A random slope for temperature had the second-best effect (AIC=3855.78, BIC=3922.81). Random slopes for duration (AIC=3867.00, BIC=3934.03), wheeze (AIC=3869.59, BIC=3936.61), asthma (AIC=3871.42, BIC=3938.44), vomiting (AIC=3873.06, BIC=3940.08), and age (AIC=3876.41, BIC=3943.43) had progressively smaller effects on model fit. We therefore added random slopes for recession, temperature, duration, wheeze, asthma, and vomiting; the model would not converge when we attempted to add the final random slope (age). The AIC in this final model was 3778.00 and the BIC was 3878.53.

TABLE S5: PRESCRIBING DECISIONS TREATED AS A 3-CATEGORY ORDINAL VARIABLE (Table 3 in the main text)

Factor	**Prescribing decisions** ***OR* [95% CI]**
Duration (ascending)	1.17** [1.14, 1.19]
Temperature	5.49** [4.25, 7.08]
Age (ascending)	1.15** [1.10, 1.21]
Recession	0.36** [0.27, 0.48]
Wheeze	0.89 [0.76, 1.05]
Asthma	1.12 [0.95, 1.31]
Vomiting	0.87 [0.74, 1.02]

***p*≤.001. Age and duration were treated as continuous in this model. The model contained random slopes for recession and temperature; adding further random slopes produced non-convergence. Three variables met proportional odds assumption (age, vomiting, asthma, *ps*≥0.218) and four did not (duration, temperature, recession, wheeze, *ps*≤0.011); specifically, the positive effects of duration and temperature increased as we moved from "step 1" (no prescription vs. delayed/immediate prescription) to "step 2" (no/delayed prescription vs. immediate prescription): ORs for duration=1.12 [1.10, 1.15] vs. 1.15 [1.12, 1.18], *ps*<0.001; ORs for temperature=4.37 [3.51, 5.45] vs. 5.73 [4.51, 7.29], *ps*<0.001. Conversely, the negative effects of recession and wheeze grew weaker as we moved from step 1 to step 2: ORs for recession=0.54 [0.44, 0.67]) vs. 0.71 [0.57, 0.89], *ps*≤0.003; ORs for wheeze=0.88 [0.77, 1.01] vs. 0.96 [0.82, 1.12], *ps*≥0.075.

FIGURE S2: MANAGEMENT SELECTIONS BY RISK ASSESSMENTS



GPs' selections for patient management, by subjective risk assessments. The Figure displays the number (top) and proportion (bottom) of times that each option for patient management was chosen. Participants could select multiple options (or none) therefore percentages do not sum to 100. The total number of cases classified as *level 1, level 2,* and *level 3* by GPs in the sliding scale [category selection] group was 113 [518], 1202 [1211], and 1693 [1279], respectively. Management was deemed "consistent" with the subjective risk assessment if 1) no option was selected in cases perceived to be *level 1*; 2) no option or a delayed prescription was selected in cases perceived to be *level 2*; or 3) 24hr GP review, immediate prescription and/or paediatric assessment was selected in cases perceived to be *level 3*.

TABLE S6: PARENTAL CONCERN

Management options	Parental concern present	Parental concern absent
Delayed prescription	9% (17/188)	5% (32/658)
Immediate prescription	7% (13/188)	9% (59/658)
24hr GP review	76% (143/188)	57% (378/658)
Admit for paediatric assessment	17% (31/188)	7% (43/658)

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