LLM-Powered Automatic Translation and Urgency in Crisis Scenarios

⚠️ *“If a **crisis alert** is mistranslated, does it still save lives?”*

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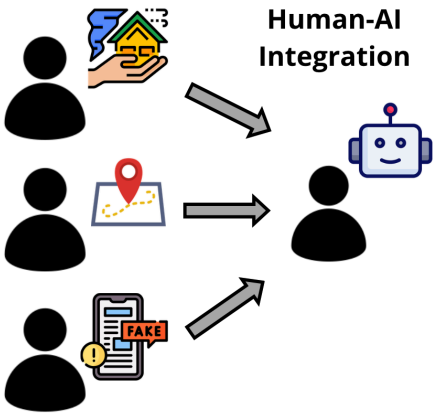
Speech+NLP+HCI

GEORGE MASON UNIVERSITY

Why multilingual crisis NLP matters

LLMs widely adopted as general-purpose systems



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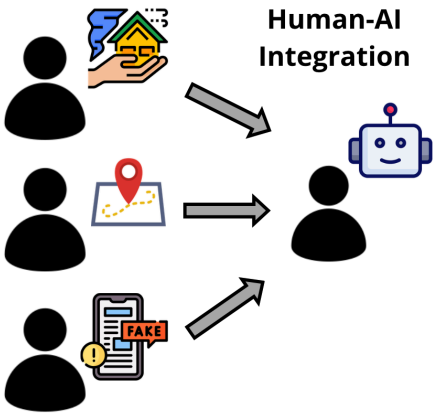

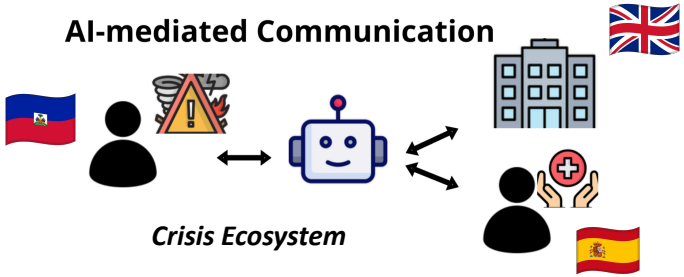

LLMs used differently by stakeholders

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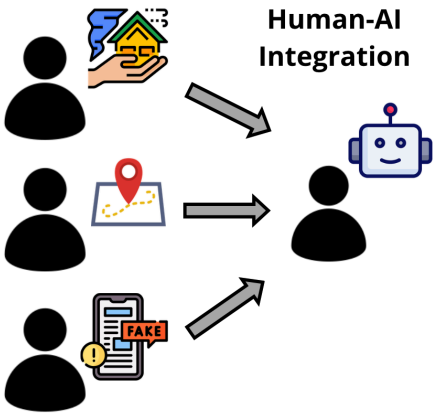
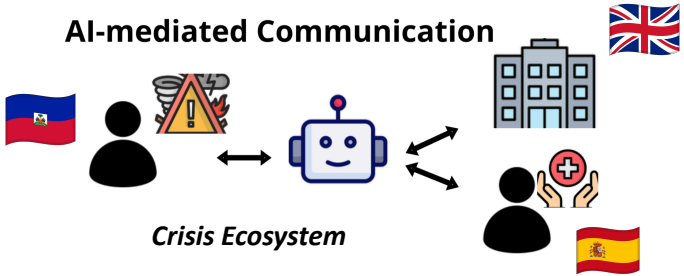


English-only benchmarks



Exposure mismatch

LLMs used differently by stakeholders

Key Gap: No rigorous **multilingual evaluation** of LLMs in **crisis relevant tasks** considering **stakeholders alignment**

Research Questions

RQ1

How does **Machine Translation performance** vary across linguistically diverse languages in the **crisis domain**?

RQ2

Do **LLMs align** with **human judgment** on urgency, and are they ***consistent*** across **languages**?

Experimental Setup

TICO-19 corpus

+20 typologically diverse languages

COVID-19 crisis domain
2k sentences / language

Human-translated gold standard

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TICO-19 corpus

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COVID-19 crisis domain
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PubMed

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Diverse MT *family* models

NLLB-200 — Meta

Aya-101 — Cohere For AI

X-ALMA

Llama 3.2 — Meta

MT quality ~ official language support

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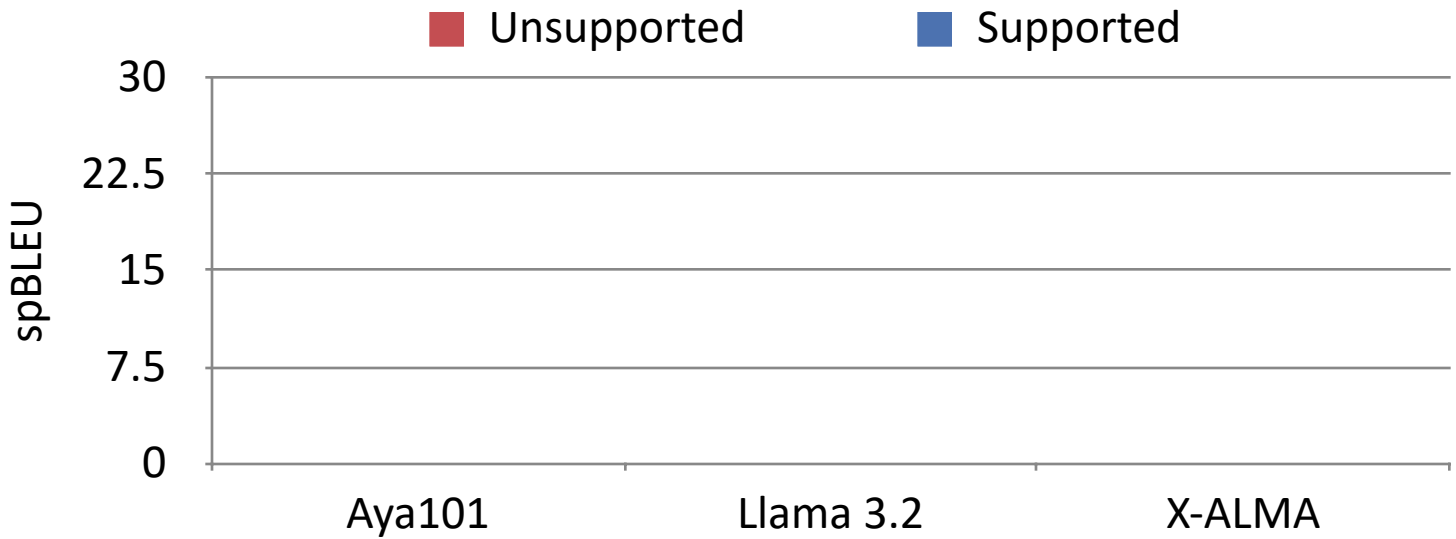

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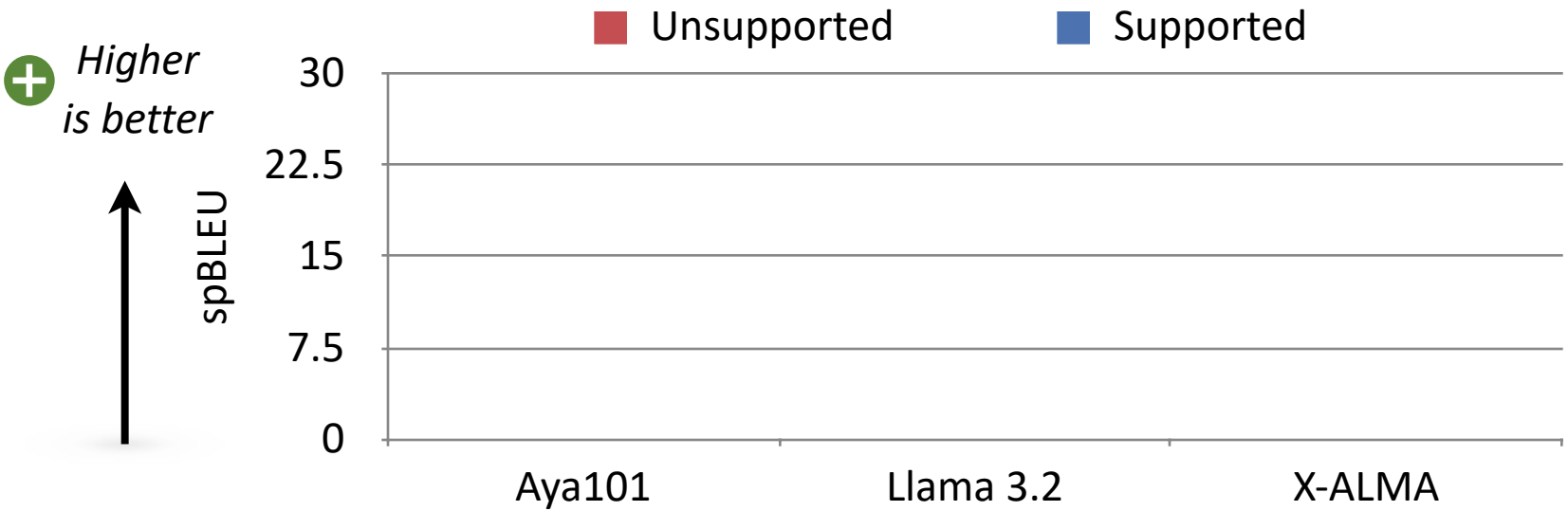

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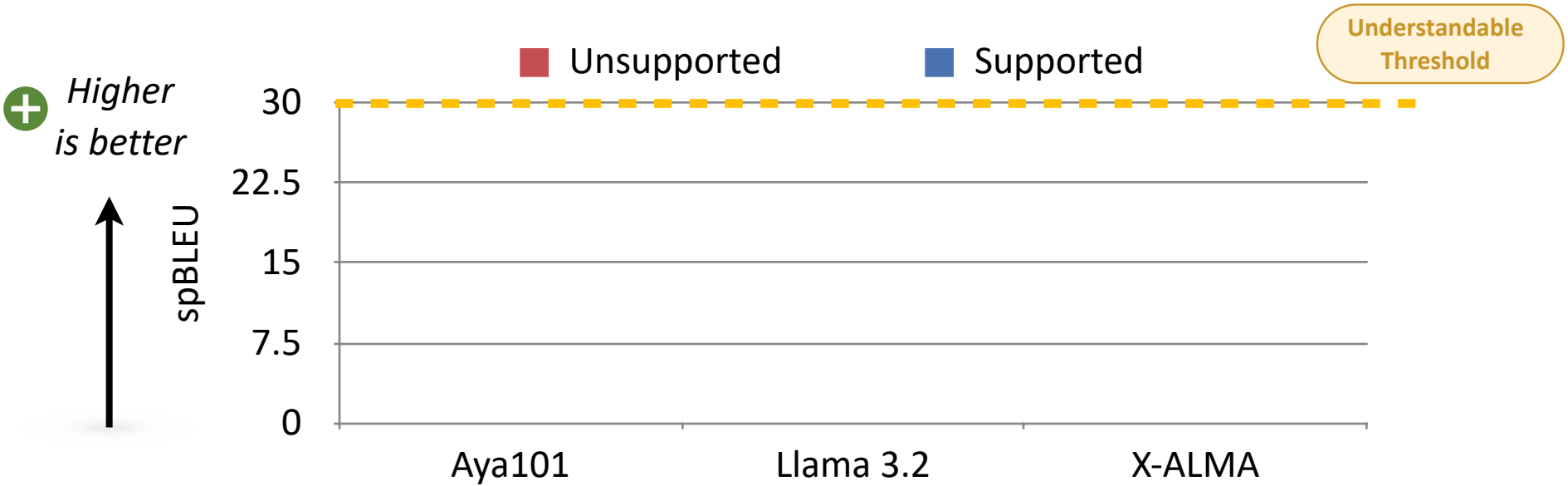

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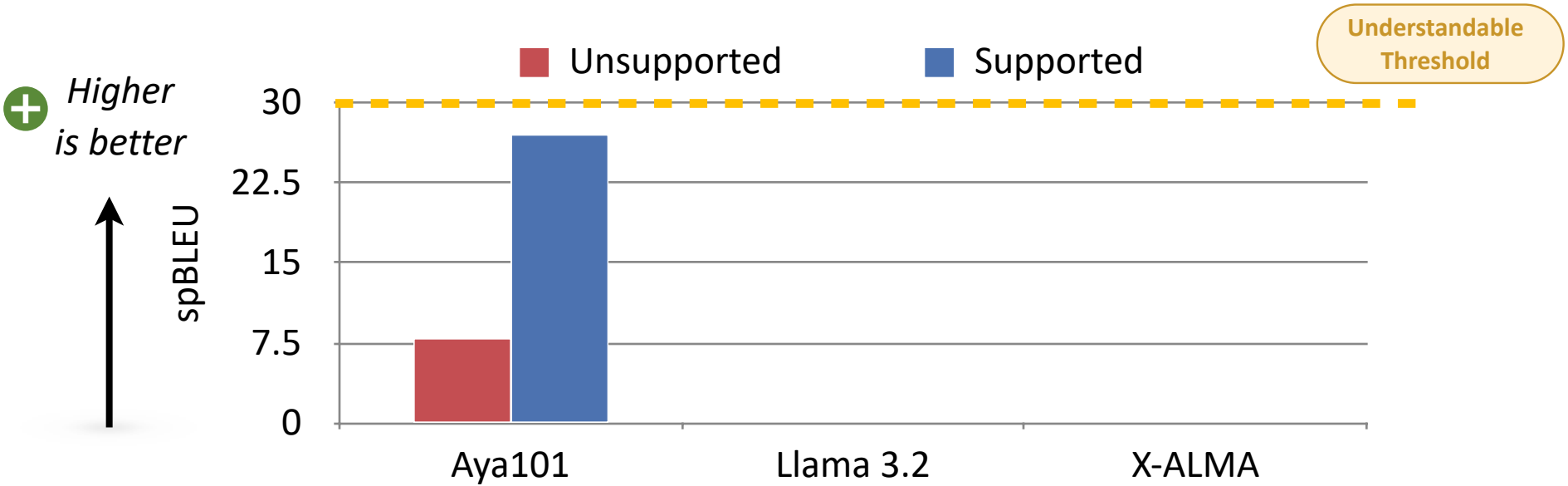

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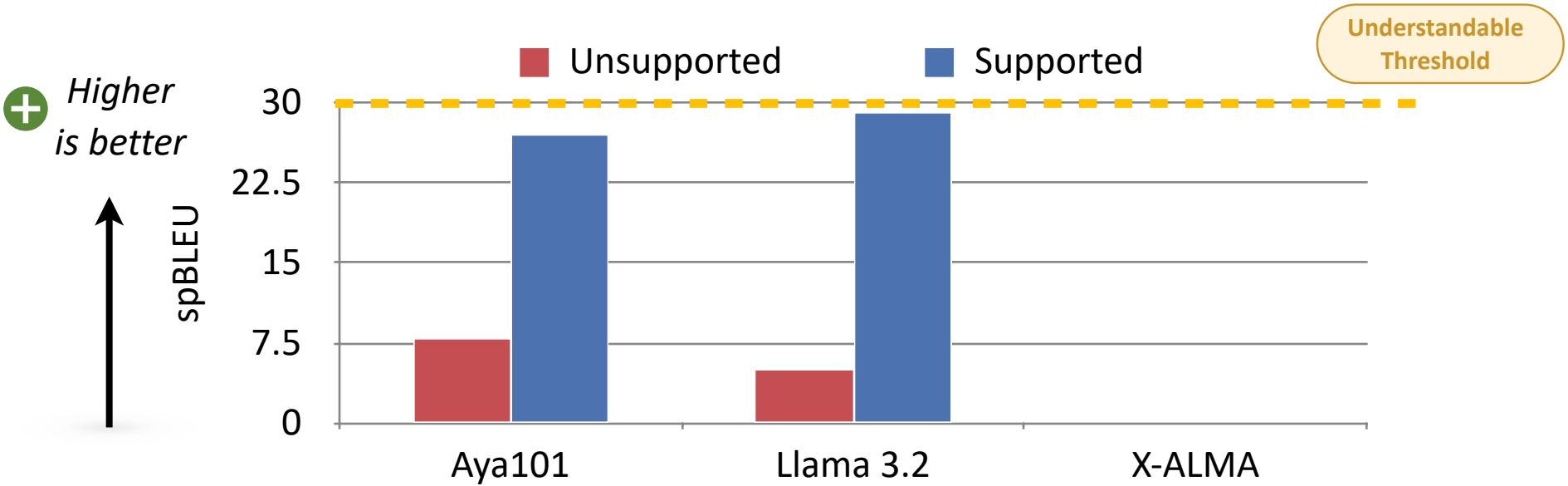

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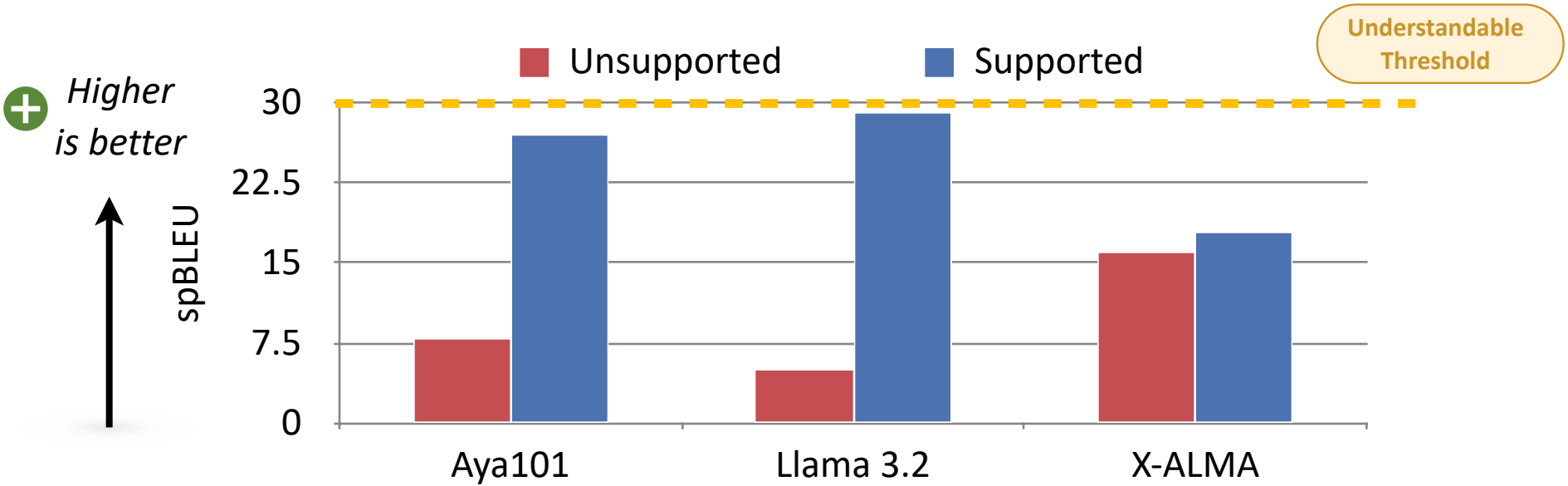

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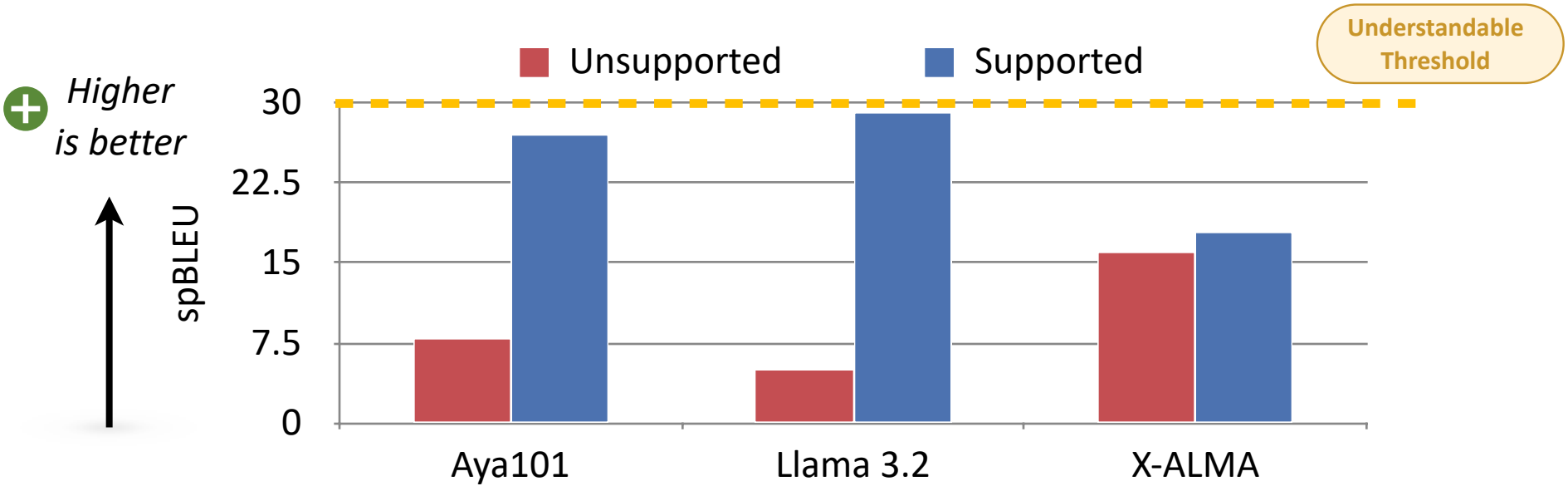

Takeaway Practical MT performance collapses for unsupported crisis languages.

Commercial Models Still Below the Bar for Usable Translation

From Bansal et al. "Is MT Ready for the Next Crisis or Pandemic?" (2026)

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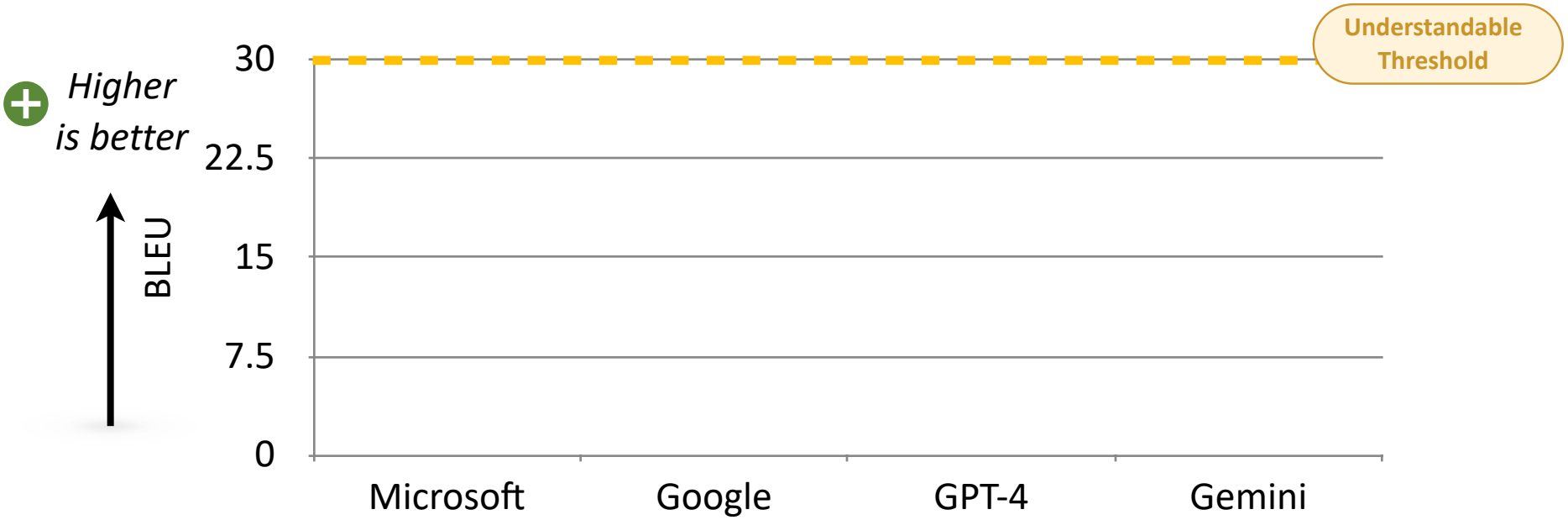

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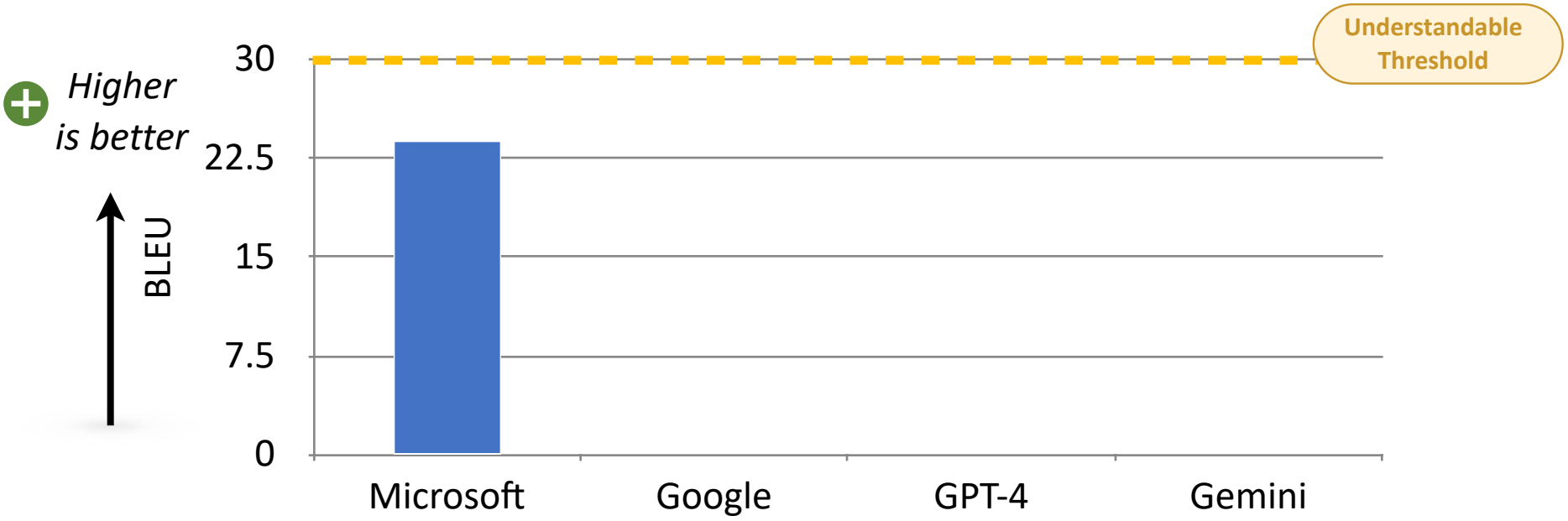

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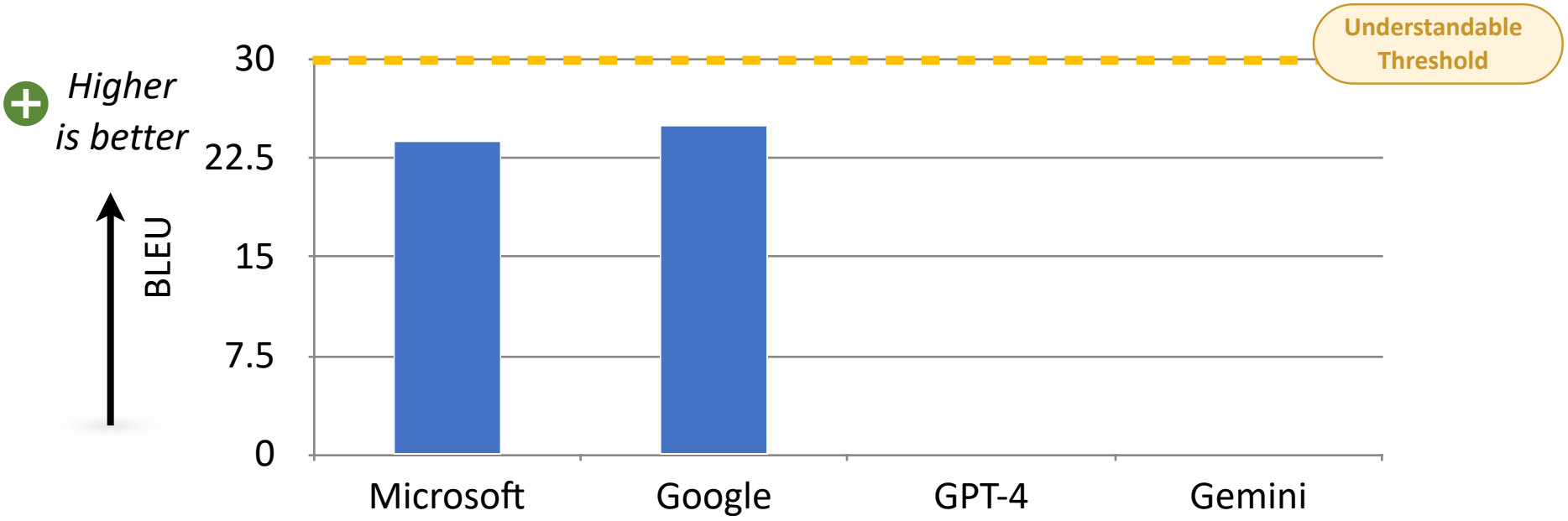

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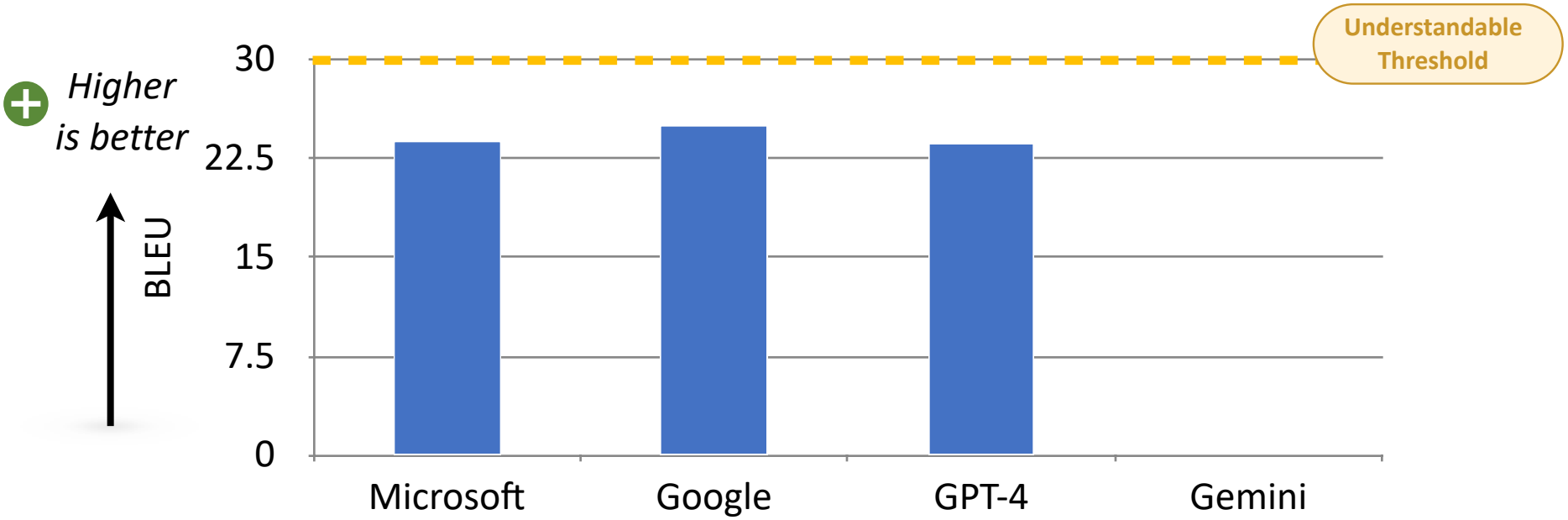

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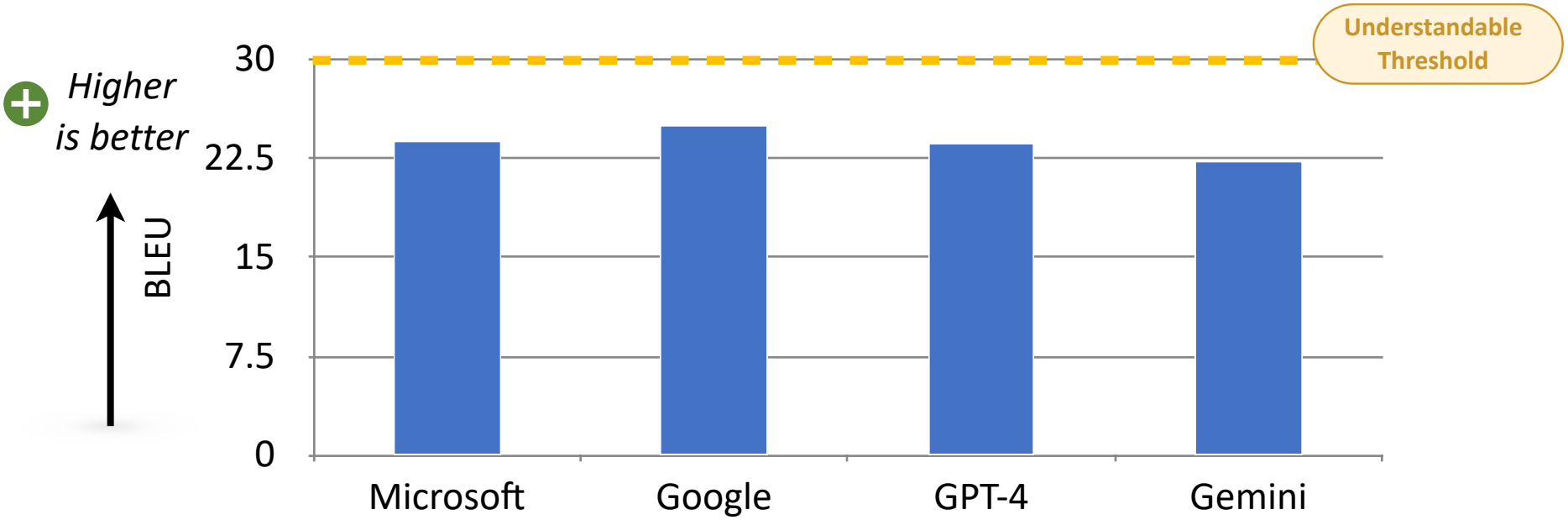

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Experimental Setup

1) GPT-4o

Generate messages convening different level of **urgency**

Natural disasters

Institutional Tone

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2) NLLB (Meta) **Translation**

19 languages

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Classify: **Level of urgency (1-5)**

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Llama 3.2 — Meta

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3a) ***LLM Annotations***

Llama 3.2 Meta

3b) ***Human Annotations***

Same scenario, humans agree

Source scenario (English) Human & LLM: HIGH

"All residents in the flood zone must evacuate immediately. Water levels are rising rapidly and the situation is becoming life-threatening."

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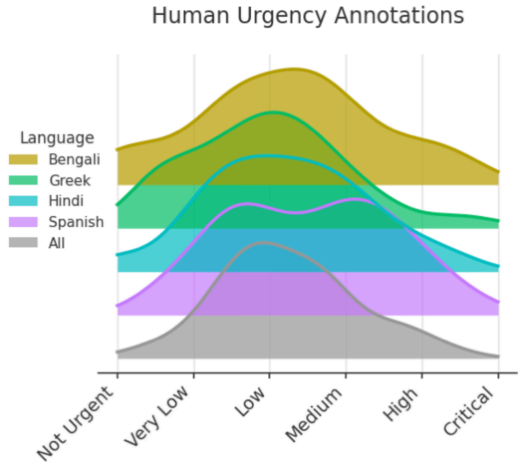

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Source scenario (English) **Human & LLM: HIGH**

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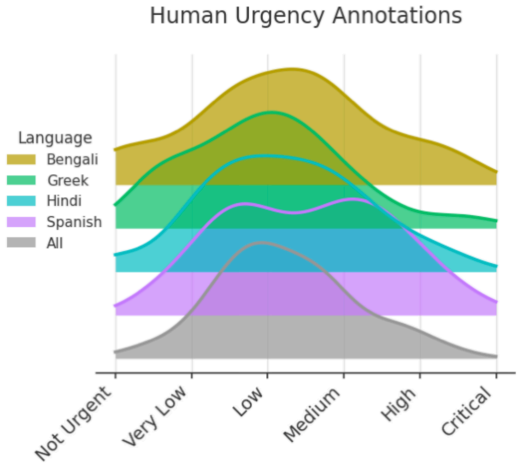
LANGUAGE	HUMANS
Span. (LA)	High ✓
Bengali	High ✓
Greek	High ✓
Hindi	High ✓



Same scenario, humans agree **but LLM don't**

Source scenario (English) Human & LLM: HIGH

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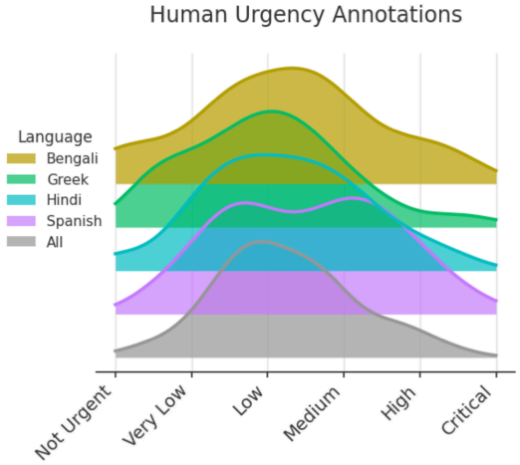
LANGUAGE	HUMANS	LLM LABEL
Span. (LA)	High ✓	Critical
Bengali	High ✓	Medium
Greek	High ✓	Very Low
Hindi	High ✓	Not Urgent



Llama 3.2 is inconsistent in urgency classification

en	*A major gas leak has been detected in the residential area; evacuation and repair teams must be deployed inst…*	Critical
es-LA	*Se ha detectado una importante fuga de gas en la zona residencial; equipos de evacuación y reparación deben…*	High
id	*Kebocoran gas besar telah terdeteksi di daerah perumahan; tim evakuasi dan perbaikan harus segera dikerah…*	Critical
mr	*निवासी भागात मोठ्या प्रमाणात गॅस गळती झाल्याचे आढळून आले आहे; स्थलांतर आणि दुरुस्ती पथके तातडीने तैनात करणे आवश्यक…*	Low
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LLMs downgrade crisis urgency in translation

Urgency *label distribution* ***differs*** *significantly* ***across languages***

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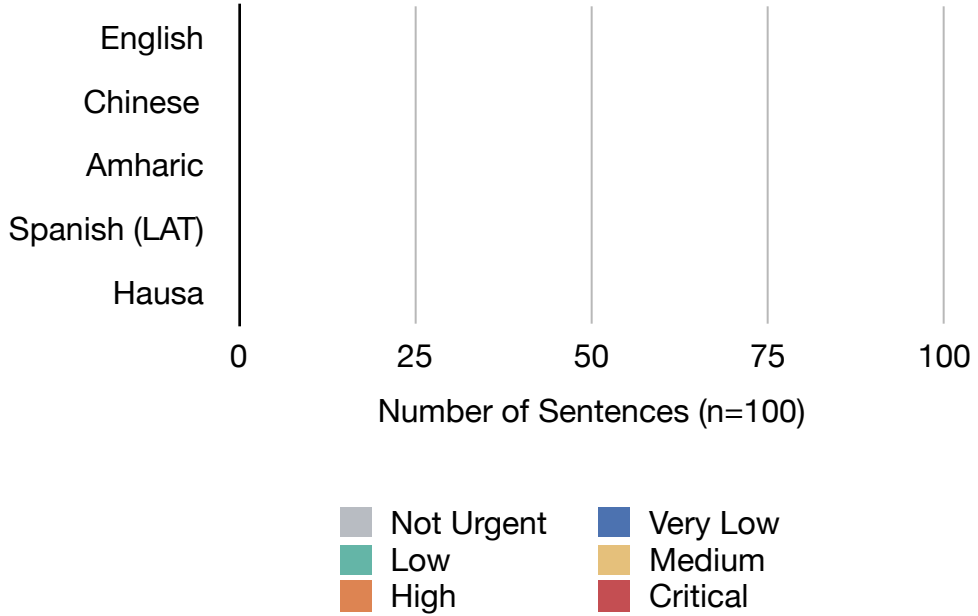

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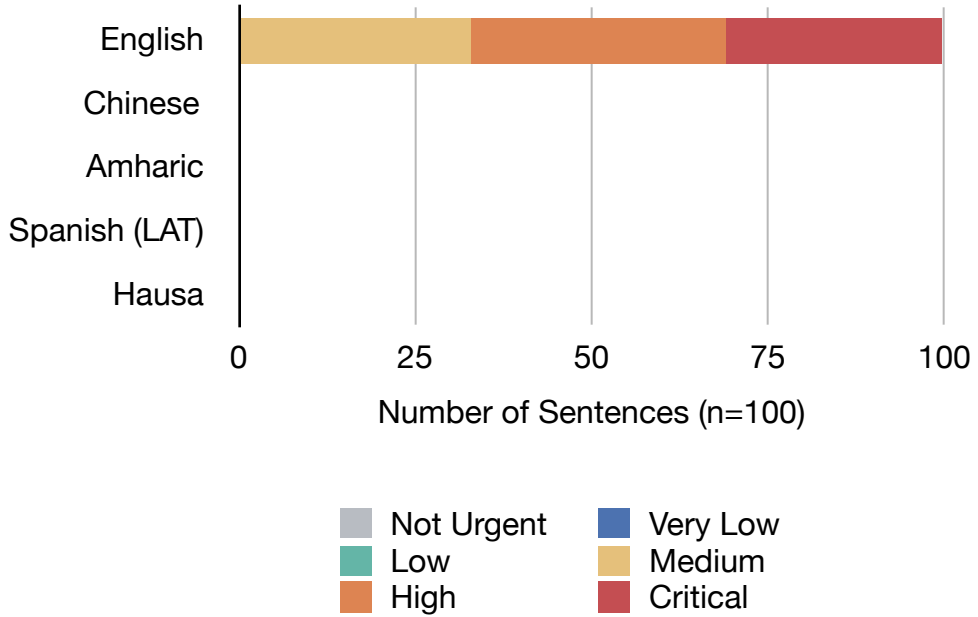

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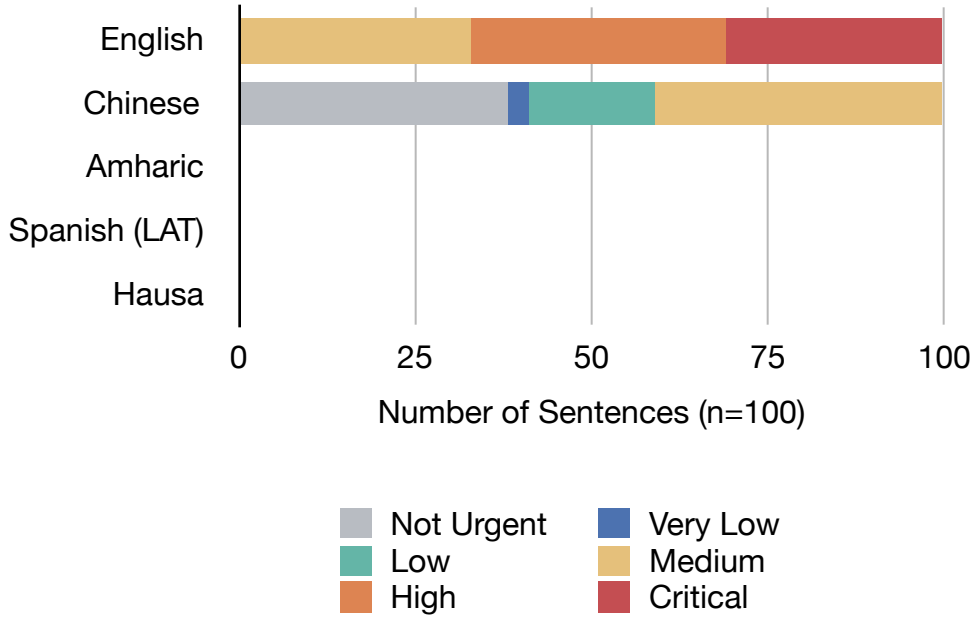

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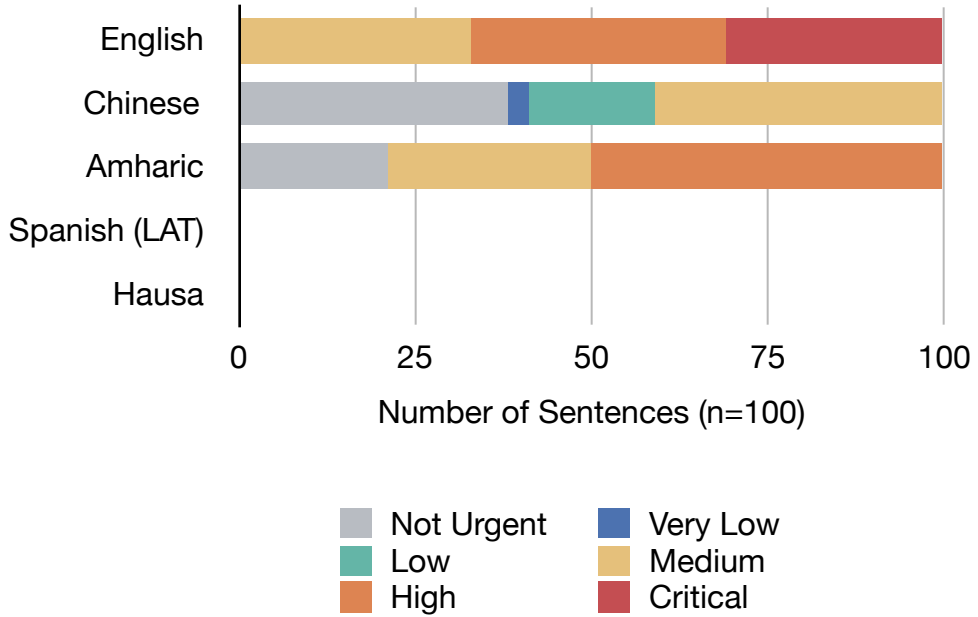

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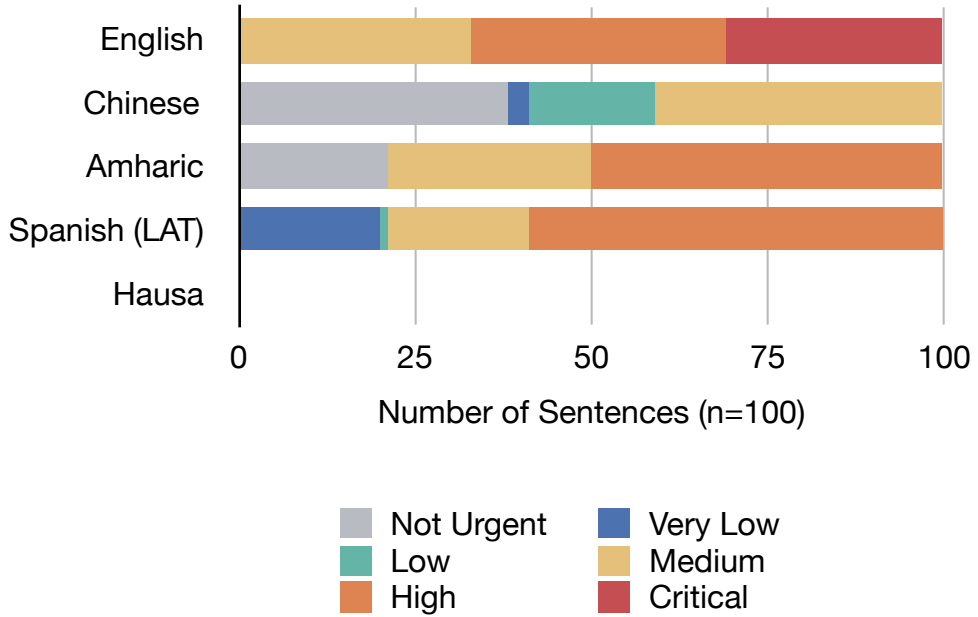

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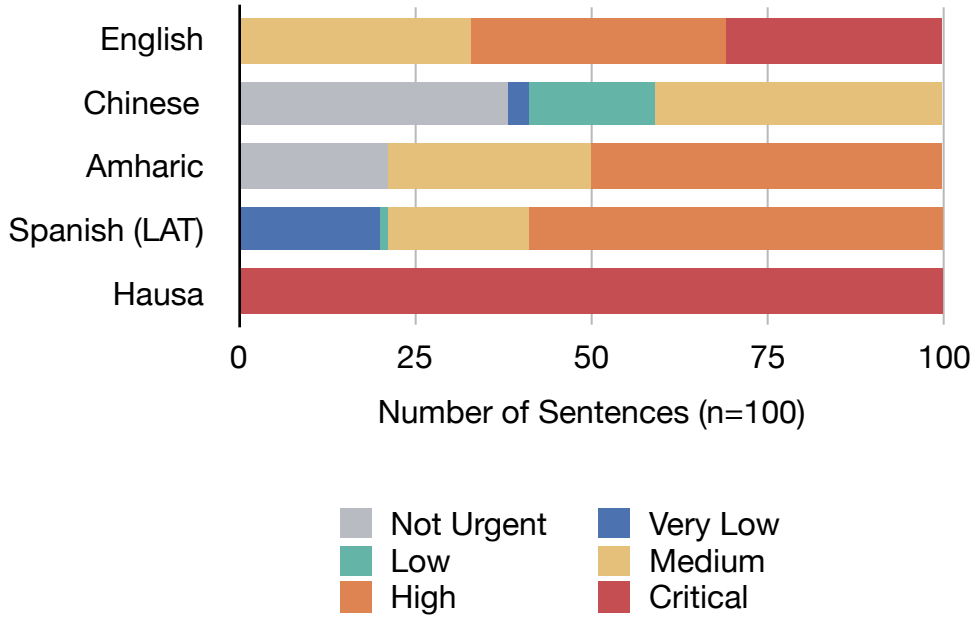
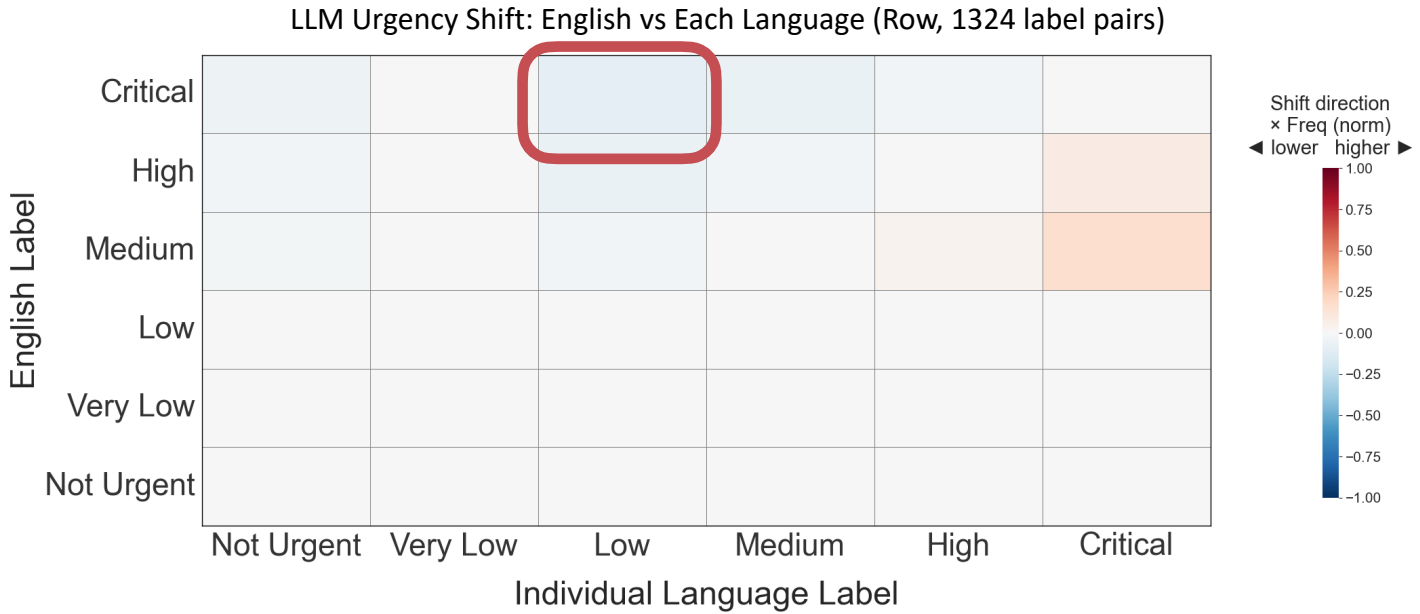


How Urgency shifts are downward/upward?

% of sentences labeled as **Critical** in English that are labeled as **Low** in X language



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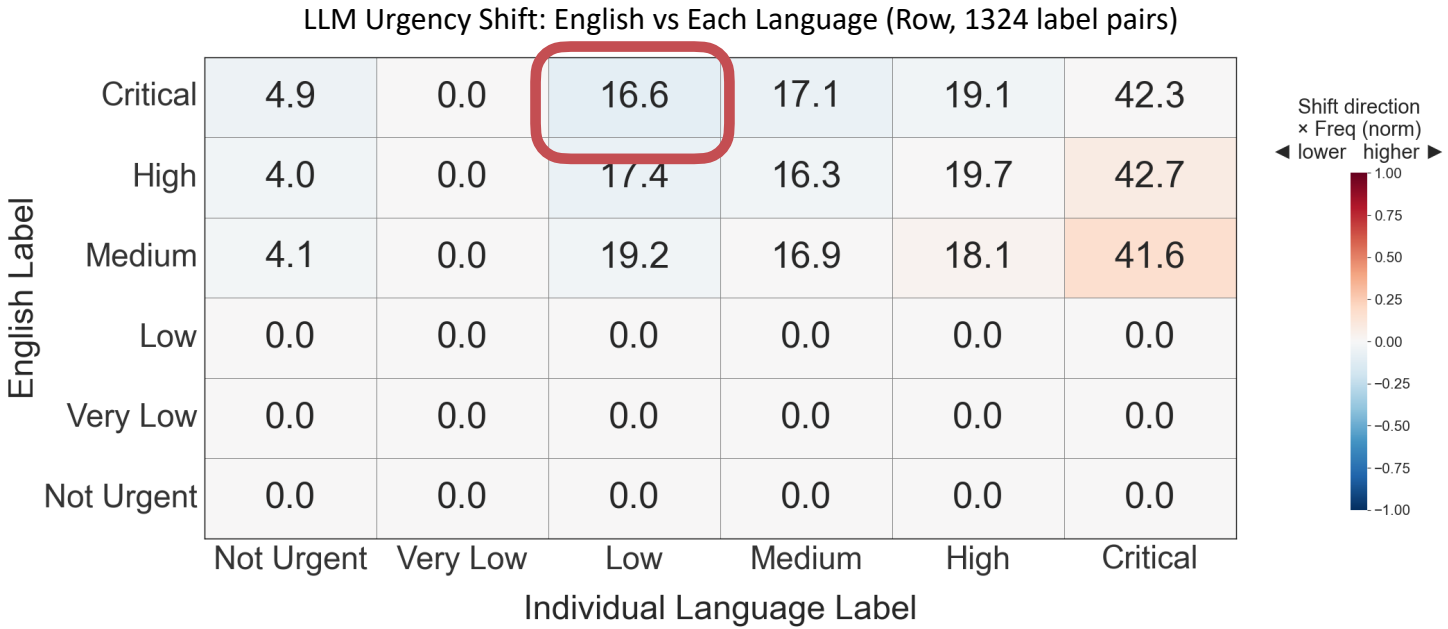

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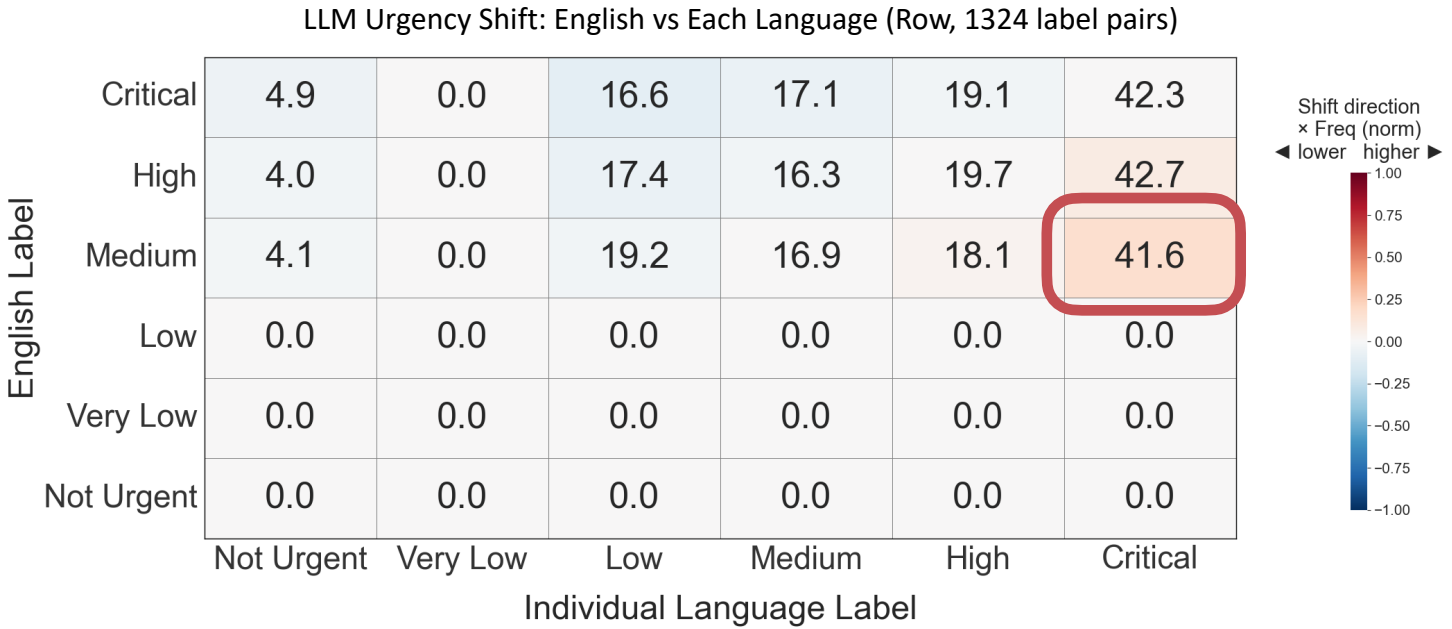

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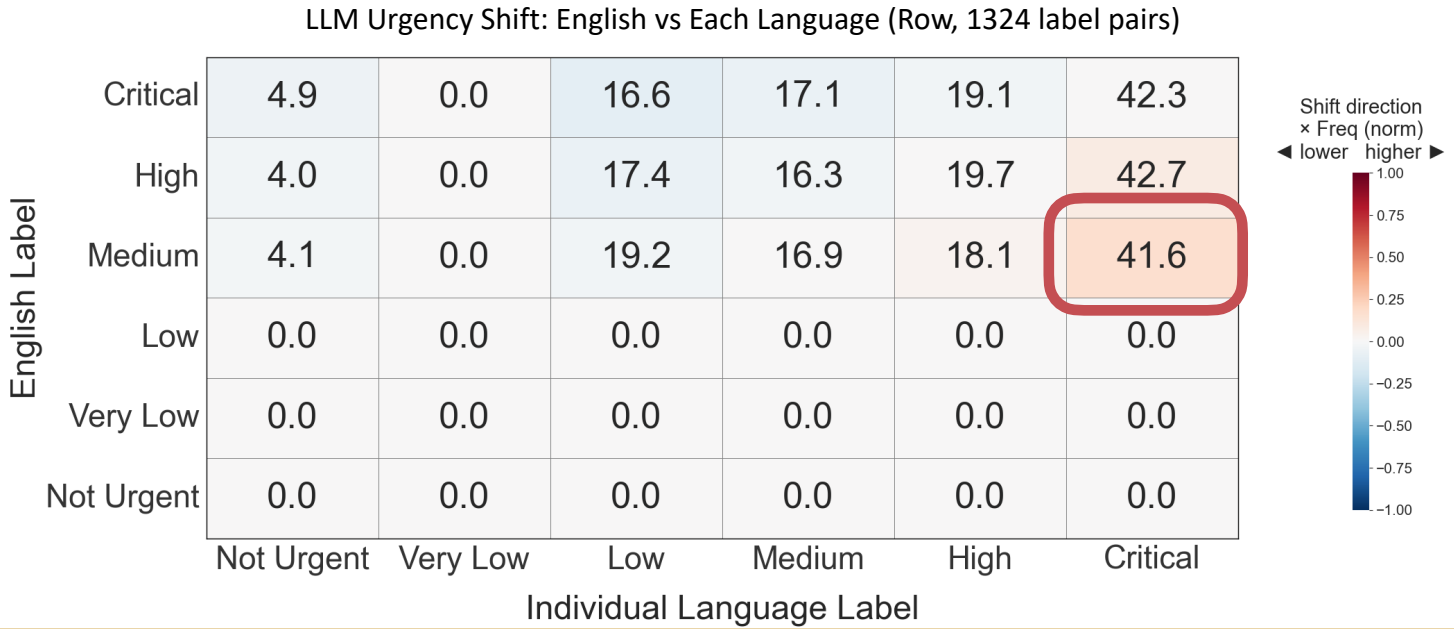

Takeaway **LLMs perform urgency classification inconsistently across languages**

Preliminary Findings

RQ1

How does **MT performance** vary across linguistically diverse languages in the **crisis domain**?

*Yes, overall **practical MT** performance **collapses** for **unsupported** languages*

RQ2

Do **LLMs align** with **human judgment** on urgency, and are they ***consistent*** across **languages**?

*No, **LLM do not align with humans** and even more concerningly they perform **inconsistently***

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- *More models for translation and annotation (open weights vs commercial)*
- *Alignment between LLMs and different stakeholders*

Thank you

Work supported by a 3 year NSF grant.
Find more at **LT4CPR.github.io**

I'm happy to collaborate in building and evaluating AI models for crisis settings

Call for papers!

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Antonios Anastasopoulos
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Speech+NLP+HCI

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