

# POCUS Without Borders: Combining Hands-On and Online Learning to Empower Low-Resource Settings


## Web-Based Deliberate Practice of Pediatric Point of Care Ultrasound (POCUS) Cases in Resource-Limited Settings.

### A Multicenter Implementation and Effectiveness Study


**Background:** POCUS offers a low-cost, radiation-free, efficient method to quickly aid in bedside decision making in resource-limited settings. There is a critical need for accessible educational interventions that enable participants case practice at their own pace and on their own time in addition to hands-on intensive trainings.

**Objectives:** To implement an online pediatric case-based POCUS course in low-resource medical settings and examine learning outcomes and feasibility.

#### Methods:




**POCUS**




**Education Intervention**


Standard "Médecins Sans Frontières" POCUS Training




Needs Assessment




Intensive In-person Training



Follow-up In-person Training

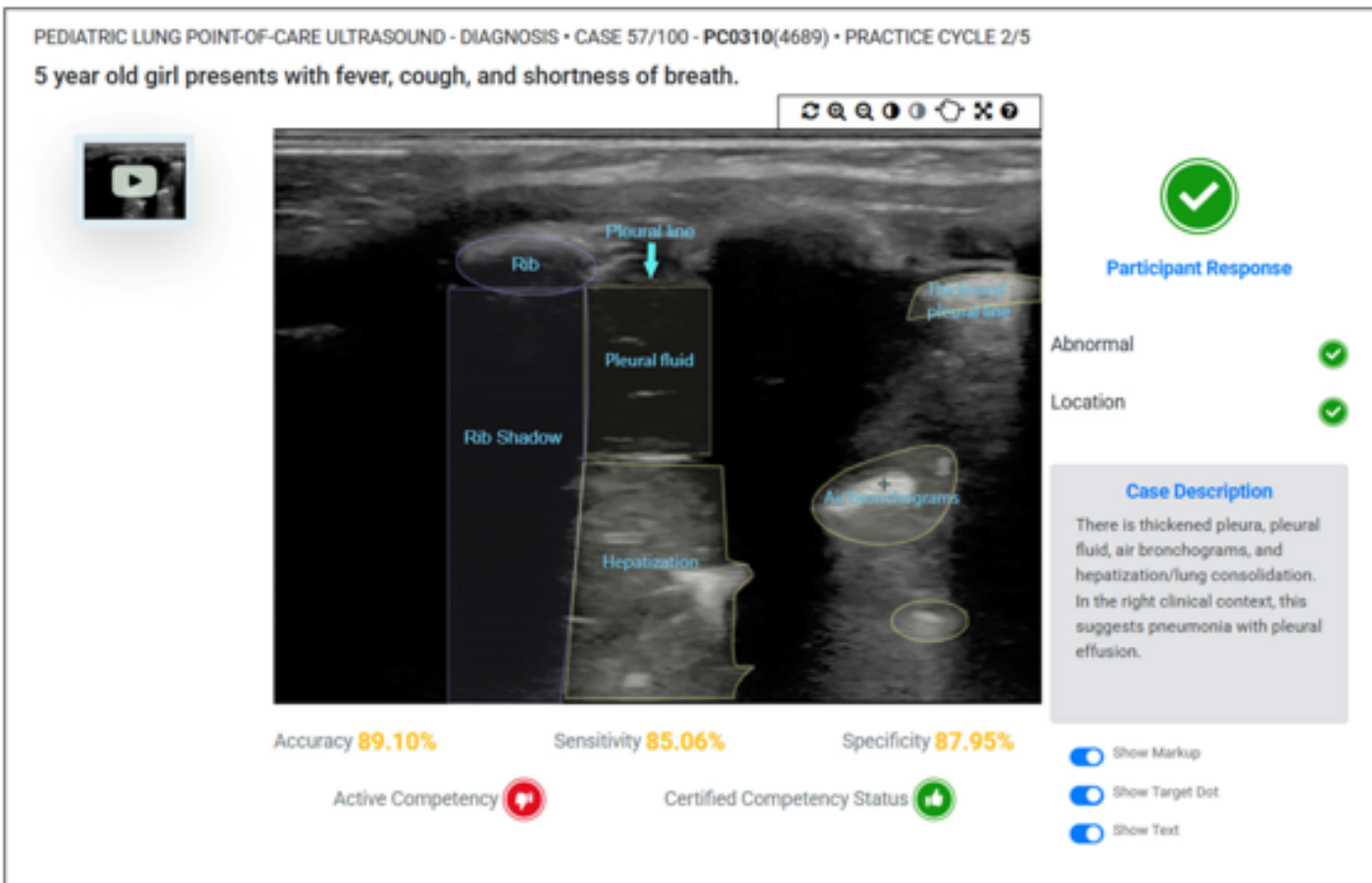



Competency Assessment



**Web-based Case Practice**

- Soft tissue, cardiac, lung, FAST applications
- Case review, submit response, feedback after every case
- 100 cases/course – up to five attempts to achieve the 90% performance standard





#### Study Design and Implementation

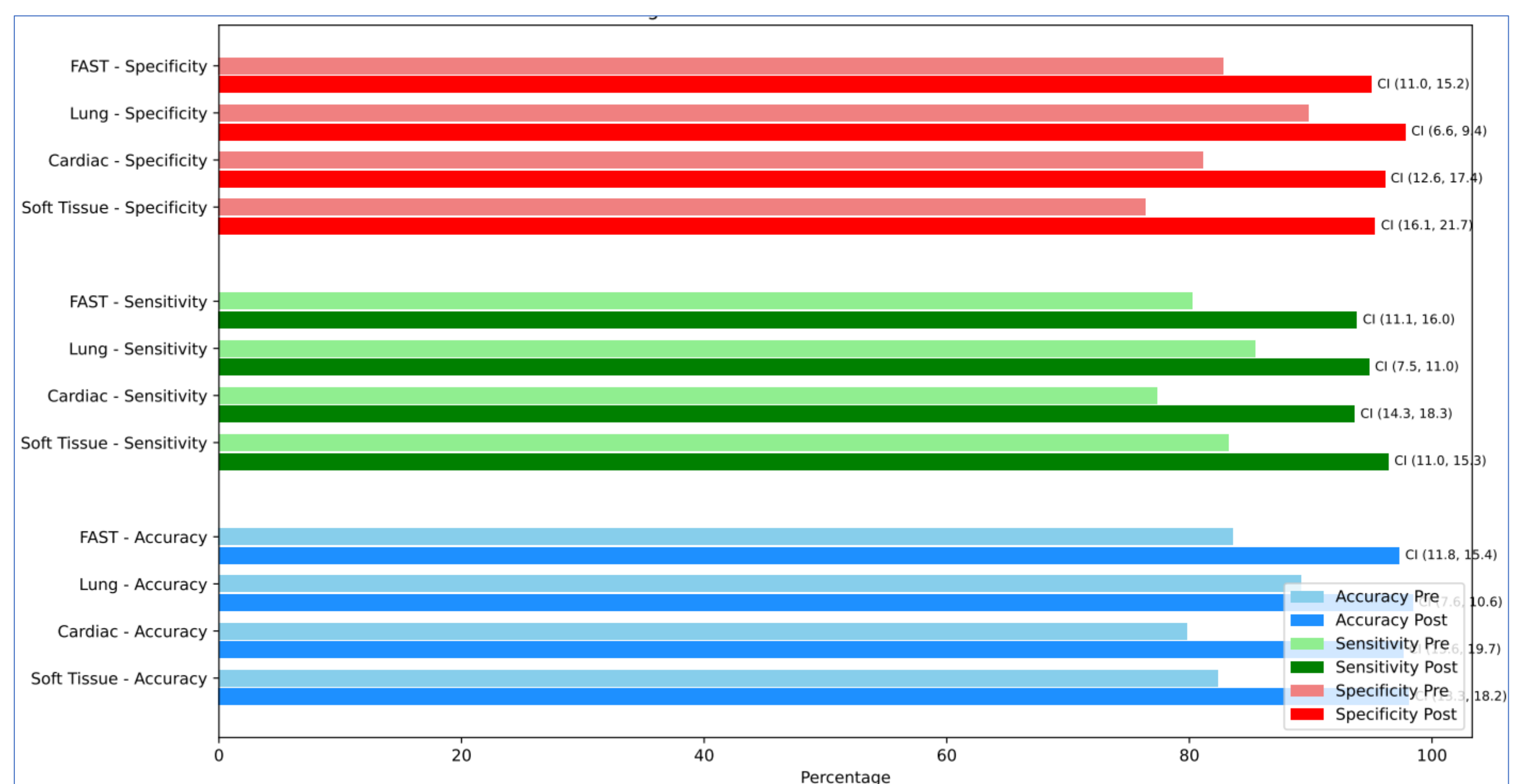
- Multicenter prospective cohort study from 2018 to 2023
- In-person intensive standard MSF teaching and web-based supplemental case experience
- 10 resource-limited health care sites in Africa (n=7) and Middle East (n=3)

#### Results:

N=152 Médecins Sans Frontières (MSF) participants completed 82,206 cases.

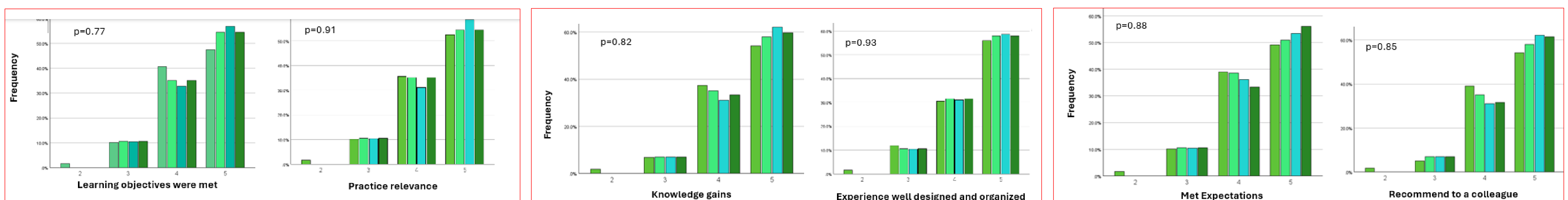
Their profiles included Clinical Officers (68%), Medical Doctors (23%), and Physician Assistants (9%) across various countries. Most are from Kenya (27 staff), Yemen (22), and the State of Palestine (21), followed by Tanzania (20), Democratic Republic of Congo (17), Bangladesh (15), Sierra Leone (11), South Sudan (11), Liberia (6), and Mozambique (2).

#### POCUS Training Outcomes: Pre vs Post with 95% Confidence Intervals



Online case-based POCUS training significantly boosts diagnostic performance across key applications.

## Participants responded positively to the online learning offer



#### Participant Feedback – Learning Outcomes

**93%** agreed/strongly agreed to have **gained significant knowledge**.  
**89%** agreed/strongly agreed to have **achieved their learning goals**, that the course was **relevant to their practice** and that it was **well organized**.

#### Participant Feedback – Barriers

- **53.6% Time**
- **49% Technical problems**
- **5.5% Managerial**
- **5.5% Language**

#### Suggestions for improvement

- Off-line application
- Reminders
- Multi-lingual
- Protected time

**Conclusions and limitations :** In resource-limited MSF settings, implementing web-based POCUS case practice demonstrated successful learning outcomes despite many of the participants encountering significant barriers. It would be critical for similar web-based initiatives to examine local challenges and reducing barriers before implementation.