"ASKING ISABEL" FOR DIAGNOSTIC DILEMMAS IN PEDIATRICS: HOW DOES A WEB BASED DIAGNOSTIC CHECKLIST PERFORM?

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BACKGROUND & SIGNIFICANCE

- Diagnostic error is an important contributor to morbidity, mortality, and medical malpractice.

- The value of diagnostic decision support (DDS) tools in reducing diagnostic errors is understudied in pediatrics.

- 'Isabel' is a web-based diagnosis checklist system which utilizes the patient's age, gender, and specific keywords to determine a list of diagnoses. Isabel initially displays 10 diagnoses with an option to "view all" to view an expanded differential.

OBJECTIVES

- To measure the performance of diagnostic decision support using challenging published cases as well as real cases of diagnostic dilemmas.

- To determine the impact of 'level of training' on inclusion on Isabel's performance.

METHODS

- An observational cohort study was performed with 2 aims:
  Aim 1: Using a case based textbook, 10 participants selected keywords from 25 cases; each read the same cases and were blinded to the diagnosis. Age, gender, and keywords were entered into Isabel. The primary outcome measure was Isabel's inclusion of the diagnosis on 'Page 1' (top 10 diagnoses) and 'View all' (top 30 diagnoses). The secondary outcome measure was the impact of level of training on Isabel's success rate. Lower level of training (LLT) was defined as medical student and resident. Higher level of training (HLT) was defined as junior and senior faculty.

  Aim 2:. A diagnostic dilemma is presented weekly at resident Professorial Rounds which is attended by medical students, residents, fellows, & faculty. Age, gender and five keywords were extracted from the presented case and run through Isabel. Isabel's ability to display the correct diagnosis was then compared to the performance of Professorial Rounds participants.

RESULTS

Isabel's performance with published cases:

- Isabel included the diagnosis in **60%** (149/248) of cases on 'Page 1', and **81%** (202/248) on 'View all' (p=0.001).
- With LLT users, Isabel included the diagnosis in **55%** (55/100) of cases on 'Page 1' compared to **64%** (94/148) with HLT (p=0.18).
- With LLT users, Isabel included the diagnosis in **78%** (78/100) of cases on 'View All' compared to **84%** (124/148) with HLT (p=0.25).

Isabel vs. Professorial Rounds participants:

- Isabel correctly included the diagnosis in **33%** (7/21) of cases on 'Page 1', and **43%** (9/21) of cases on 'View all' (p=0.35).
- Participants determined the correct diagnosis in **57%** of cases (12/21) vs. Isabel's **43%** (9/21) (p=0.18)
- Participants did not determine the correct diagnosis in **43%** (9/21) cases. Isabel included the correct diagnosis in **44%** of these cases (4/9).
- 5 of the 21 (24%) cases were not identified by either Professorial Rounds participants or by Isabel
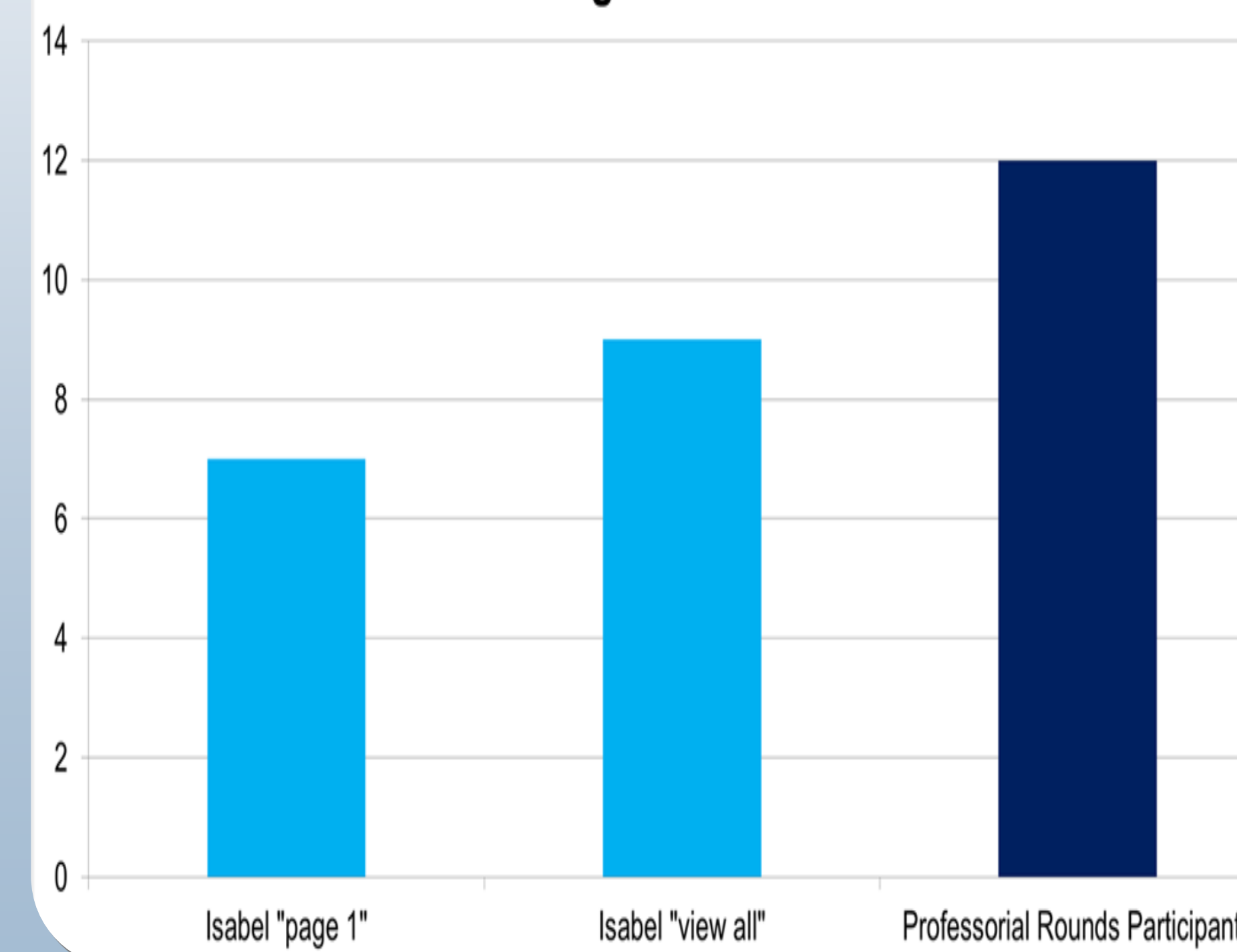

Percent of Cases Identified by Isabel on Page 1 vs. View All

n=248
P<0.001
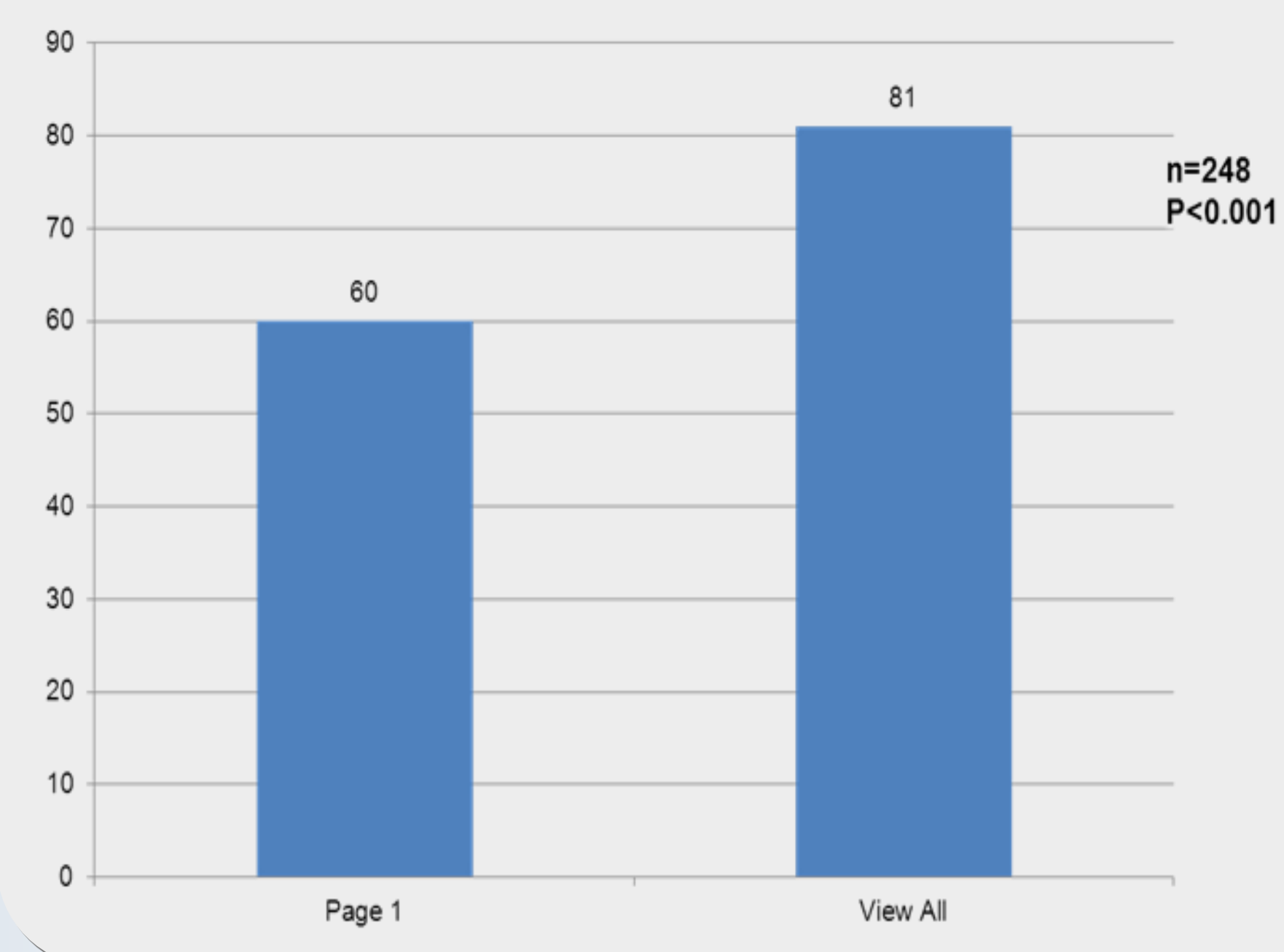
Percent of Cases Identified by Isabel by Level of Training
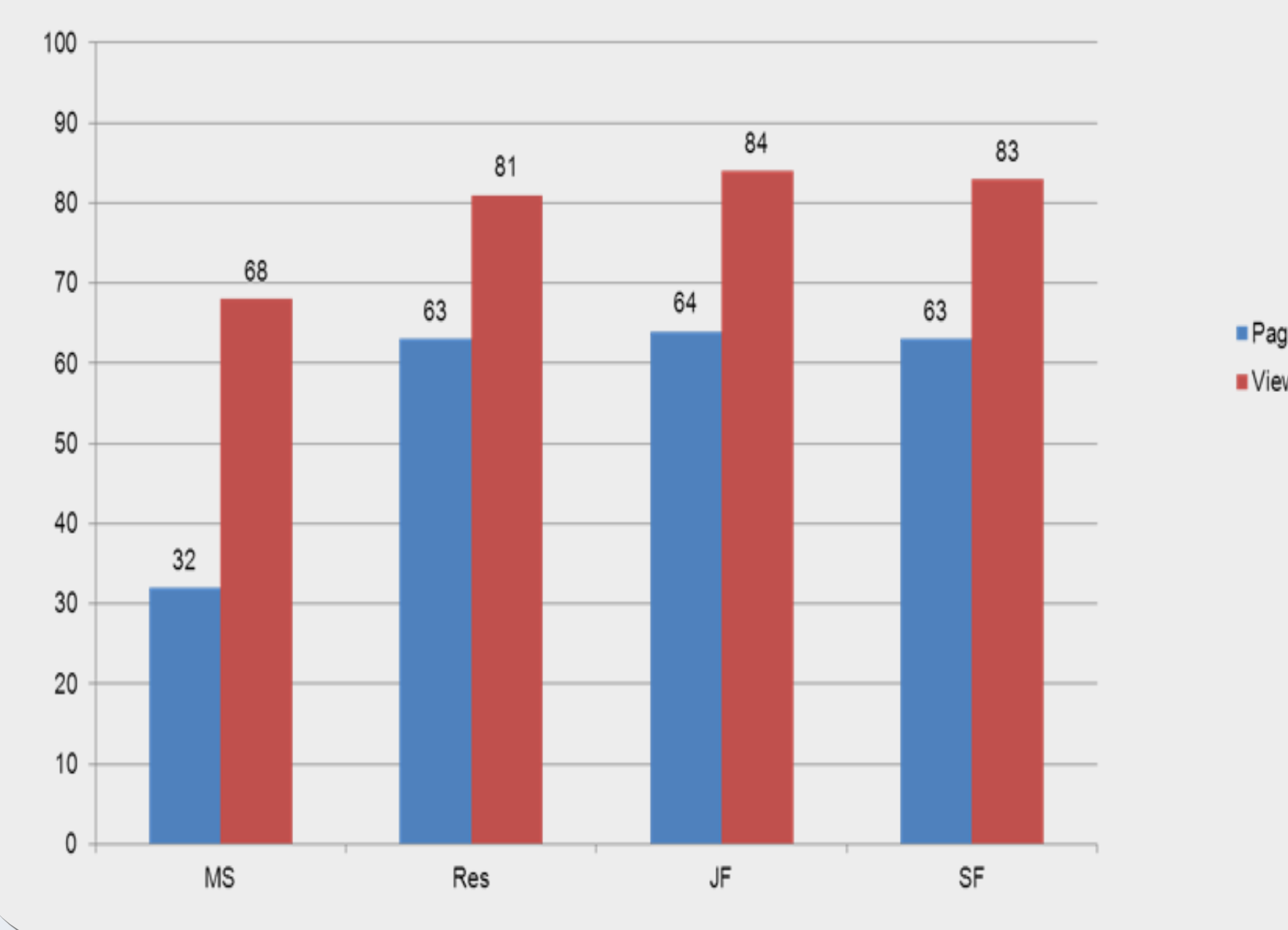
Correct Diagnosis Determined

CONCLUSIONS

- Isabel included the diagnosis in up to 81% of challenging published diagnostic dilemmas and up to 43% of weekly conferences. Level of training did not have a significant impact on Isabel's performance suggesting this tool may benefit a wide variety of users.

- Isabel's 'View All' performed significantly better than 'Page 1' with published diagnostic dilemmas within all levels of training

- There was no statistical significance between Professorial rounds participants ability to determine the correct diagnosis and Isabel's although the power was limited by sample size

- Isabel included the correct diagnosis in 4 cases in which professorial rounds participants collectively did not include the correct diagnosis. This supports the use of diagnostic decision support tools as an **adjunct** to physician generated differentials

FUTURE DIRECTIONS

- Retrospective analysis of Isabel's performance with cases of diagnostic error related series adverse events could provide evidence for it's value and return on investment.

- Prospective studies to assess the impact of DDS on diagnostic error reduction, resource utilization, cost, and length of stay.

REFERENCES

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2. IsabelHealthCare.com: Isabel; The Diagnostic Checklist
3. Bond WF, Schwartz LM, Weaver KR, Levick D, Giuliano M and Graber ML. *A Qualitative Review of Differential Diagnosis Generators*, DEM, Oct 2010.