



# Dermatology ECHO: An evaluation of physician learning using the guided practice model

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## Introduction and Background

Extension for Community Healthcare Outcomes (ECHO) utilizes **telemedicine technologies** to deliver **mentoring and education to rural and isolated primary care providers (PCPs)**. Dermatology ECHO sessions consist of hour-long weekly **virtual case-based learning**, and continuing medical education (CME)-approved didactic presentations (Figure 1). Actual de-identified cases are presented by participating PCPs to the Dermatology ECHO hub team of general dermatologists, pediatric dermatologists, a dermatopathologist, a clinical psychologist and a health literacy expert who **guide and mentor them in clinical diagnosis and management**.

Traditional telemedicine has been successful in addressing direct patient care over the past four decades, but its main limitation of providing one-to-one care still remains today. The current use and availability of emerging services, however, allows for a disruptive innovative approach to include a **one-to-many service optimizer**.

The primary objective of this retrospective study was to **quantify the degree of diagnostic disagreement** between participating PCPs compared to dermatologists. Our aim was also to **evaluate the associated patient characteristics**.



Figure 1: Dermatology ECHO Session

## Methods

This was a retrospective cross-sectional study examining the diagnostic concordance between participating PCPs and dermatology specialists. We also analyzed the preliminary data collected about each case ( patient gender, age, race and ethnicity, the location/site of dermatologic problem, treatments tried, provisional diagnosis/diagnoses, additional problem list, medication allergies, medication list etc.). We used the Dermatology ECHO recordings and submitted case reports to collect the data.

Dermatology ECHO sessions and de-identified patient cases presented between November 2015 and July 2017 were analyzed:

- There were a total of 62 Dermatology ECHO sessions and 148 patient case presentations.
- Of 148 patient case presentations, 141 were new and 7 were follow-up cases.
- We excluded follow-up case presentations as well as 19 other cases that had incomplete case reports.
- A total of 122 case presentations were analyzed.
- We completed a Pearson's chi-square test to discover the relationship between provisional diagnoses by participating PCPs and final diagnoses by dermatologists, as well as the one-way ANOVA and a Tukey test to understand the statistical significance of the analysis.

## Results

- 52% of cases involved two or more sites and 48% of cases presented by primary care providers at Dermatology ECHO involved only one site on the body (Figure 2).
- 73.8% of the 122 unique complete cases had provisional diagnoses made by primary care providers that were in the same category of at least one of the final presumed diagnoses made by the MU Dermatology Team, and 61.5% of these cases had provisional diagnoses that were identical to one of the presumed final diagnoses made by the MU Dermatology Team.
- However, the percentage of cases with identical matching diagnoses greatly improved from 2016 to 2017 (48.9% to 68.9%, p-value = 0.034,  $\alpha = 0.05$ ), indicating that weekly didactic presentations and case-based learning may increase the capacity of participating PCPs to diagnose complex dermatologic conditions (Figure 3, Figure 4).

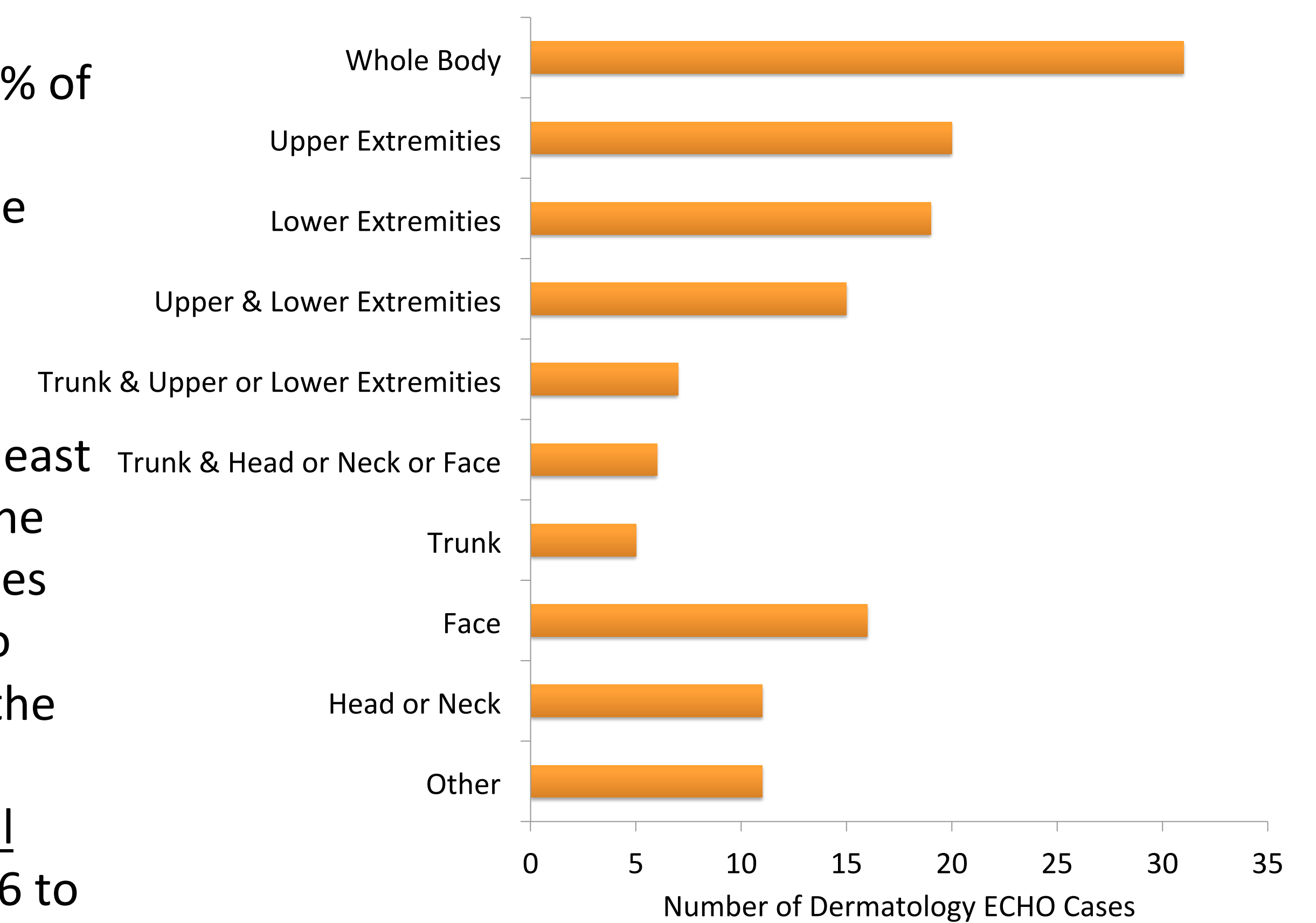


Figure 2: Problem Sites of Cases

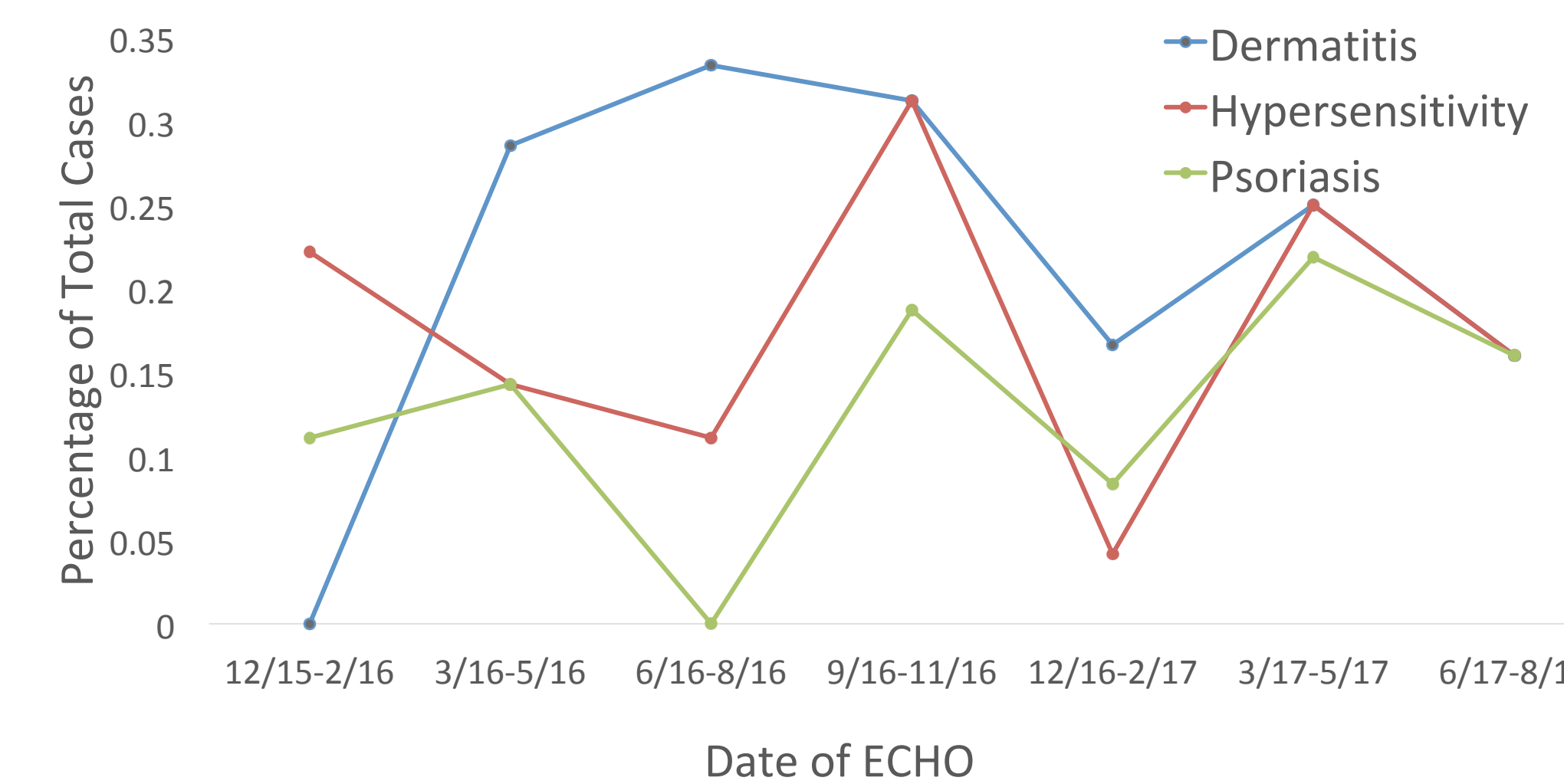


Figure 4: Percentage of Total Cases Covered by the Three Most Common Diagnoses Over Time

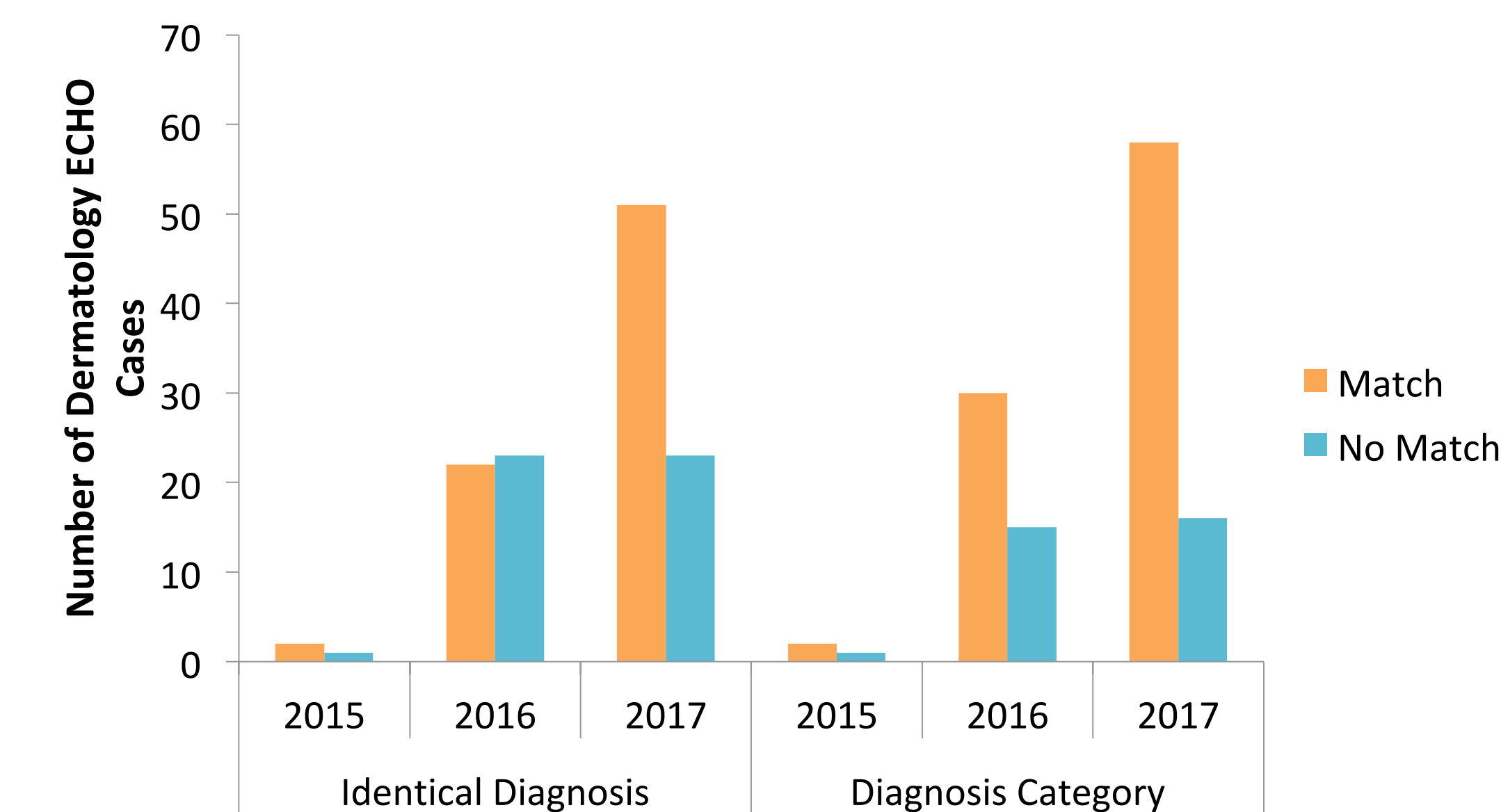


Figure 3: Provisional Diagnoses that Matched Final Diagnoses by Year

## Conclusions

- The most prevalent provisional and final diagnoses were in the categories of dermatitis, hypersensitivity, and psoriasis/scaling. These categories were also the most prevalent of the cases that had matching provisional and final diagnosis categories. These findings indicate the need to focus didactic presentations on dermatologic disorders within these categories to further improve the percentage of provisional diagnoses that identically match final diagnoses.
- The significant improvement in PCPs' ability to correctly diagnose dermatologic conditions after participating in Dermatology ECHO may indicate the impact the virtual community has on physician learning outcomes.

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