Family Medicine Physician Density and Population Health in Florida for 2010, 2013 and 2016

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Background

For many patients, family medicine physicians are the first line of defense against the adverse effects of chronic disease, preventing costly and risky hospitalizations due to their underlying conditions.[1] With increasing rates of chronic disease and a rapidly growing population, the role that family physician supply has on health outcomes in Florida may help to inform health policy.

There are several studies that suggest that the number of primary care physicians in a population is significantly associated with improved population health outcomes such as increased life expectancy and decreased hospitalizations; however, some do not account for socioeconomic variables or changes in the relationship of those variables over time.[2-6]

Due to Florida's unique demographics of a high proportion of elderly, a rapidly growing general population, pockets of socioeconomic disparity, and a large relative proportion of minority communities, national trends may not necessarily follow the same pattern within the state.[7]

Objective

We investigate the correlation between family medicine physician density and population health outcomes. We used obesity as a marker of primary prevention, hospitalizations due to coronary artery disease (CAD) as a marker of secondary prevention and life expectancy and death rate as markers of tertiary prevention.

Methods

We downloaded publicly available data from the Florida Department of Health website for the years between 2010-2018.[8] For each year, we have the count of licensed family physicians per 100,000 population and the health outcomes (obesity, hospitalization due to coronary artery disease [CAD rate], life expectancy, and death rate) for each county. Obesity measures were available only for the years of 2010, 2013 and 2016, therefore we report these years. The UCF IRB approved this study. All analysis were done using STATA 14.

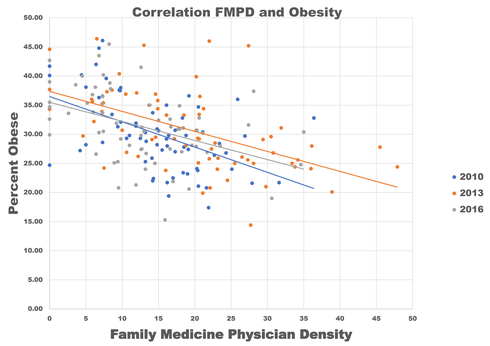
Results

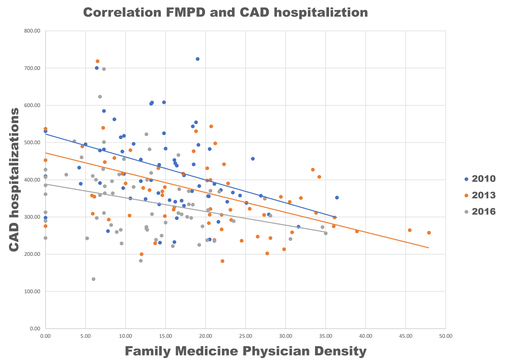
Correlation of Family Medicine Physician Density &	Obesity	CAD rate	Life expectancy	Death rate
2010	-0.5014*	-0.3361	0.0539	-0.1510
2013	-0.5333*	-0.3925*	0.3555*	-0.2642
2016	-0.4433*	-0.3023	0.1093	-0.0616

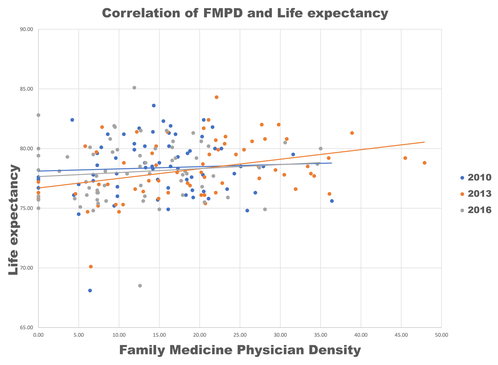
*P<0.05

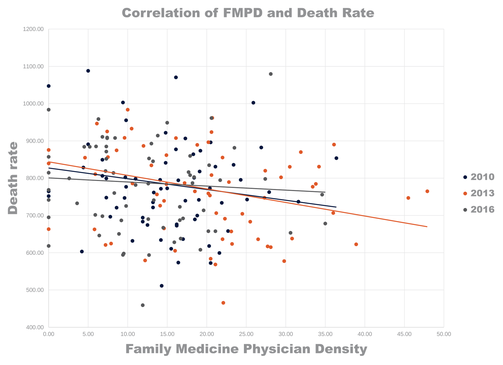
While all the correlation coefficients for the comparison of Family Medicine Physician Density (FMPD) and obesity were statistically significant, the coefficients in 2010 and 2013 demonstrate moderate inverse correlation and in 2016 low inverse correlation. The statistically significant coefficient for FMPD and CAD hospitalization is a low inverse correlation. The statistically significant coefficient for Life expectancy and FMPD is a low positive correlation.

From the linear trendline, 2.3 family physicians per 100,000 would decrease the obesity rate by 1% in 2010. For 2013 and 2016, the number needed to decrease obesity by 1% was 3. For CAD hospitalization in 2013, 18.8 family physicians decreased the rate by 100. For life expectancy in 2013, 12.5 family physicians added 1 year of life.









Discussion

The inverse association between FMPD and obesity rate represents the strongest correlations in our analysis. This suggests that family medicine physicians play a vital role in promoting primary prevention within the communities they serve. The weak correlation between FMPD and CAD hospitalizations was surprising, as increased primary care physician density is typically associated with a decrease in hospitalizations.[9] The lack of associations between FMPD and both life expectancy and death rate for most years could point to the multifactorial nature of chronic disease management.

We have several limitations. Social determinants of health were not examined and they influence these health outcomes. Other primary care providers would also impact the outcomes we studied.

Conclusion

Family physician density correlated with a primary prevention outcome (obesity), but not with the secondary or tertiary health outcomes.

We anticipate that this study will lead to further research of health and socioeconomic impact of family physicians in our state.

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