



The Impact of Family Physicians in Rural Maternity Care

Mark Deutchman MD

Katherine A. James PhD, MS, MSPH

Francesca Macaluso MPH

Mark Deutchman, MD; Francesca Macaluso, MPH; Emily Bray, MD; David Evans, MD; James Boulger, PhD; Kathleen Quinn, PhD; Carrie Pierce, MD; Emily Onello, MD; Jana Porter, MS; Wendy Warren, MD; Jay S. Erickson, MD; Patrick Bright, MA; Philip Maness, MR; Shanon Luke, MS; Katherine A. James, PhD, MS, MSPH

Acknowledgements: the many medical students, research assistants, and others who assisted with data collection, and participating hospitals

BACKGROUND

Rural Healthcare

- Access to healthcare is limited in rural areas
- Unique challenges to improving access to care
 - Low population density
 - Lower income levels
 - Difficulty recruiting physicians



Rural Maternity Care

- Infant mortality is 20% higher in rural counties
- ~45% all rural hospitals have no intrapartum services
- Over 50% of women in rural areas travel 30+ minutes for prenatal care
 - ~10% in urban areas



Family Medicine and Maternity Care

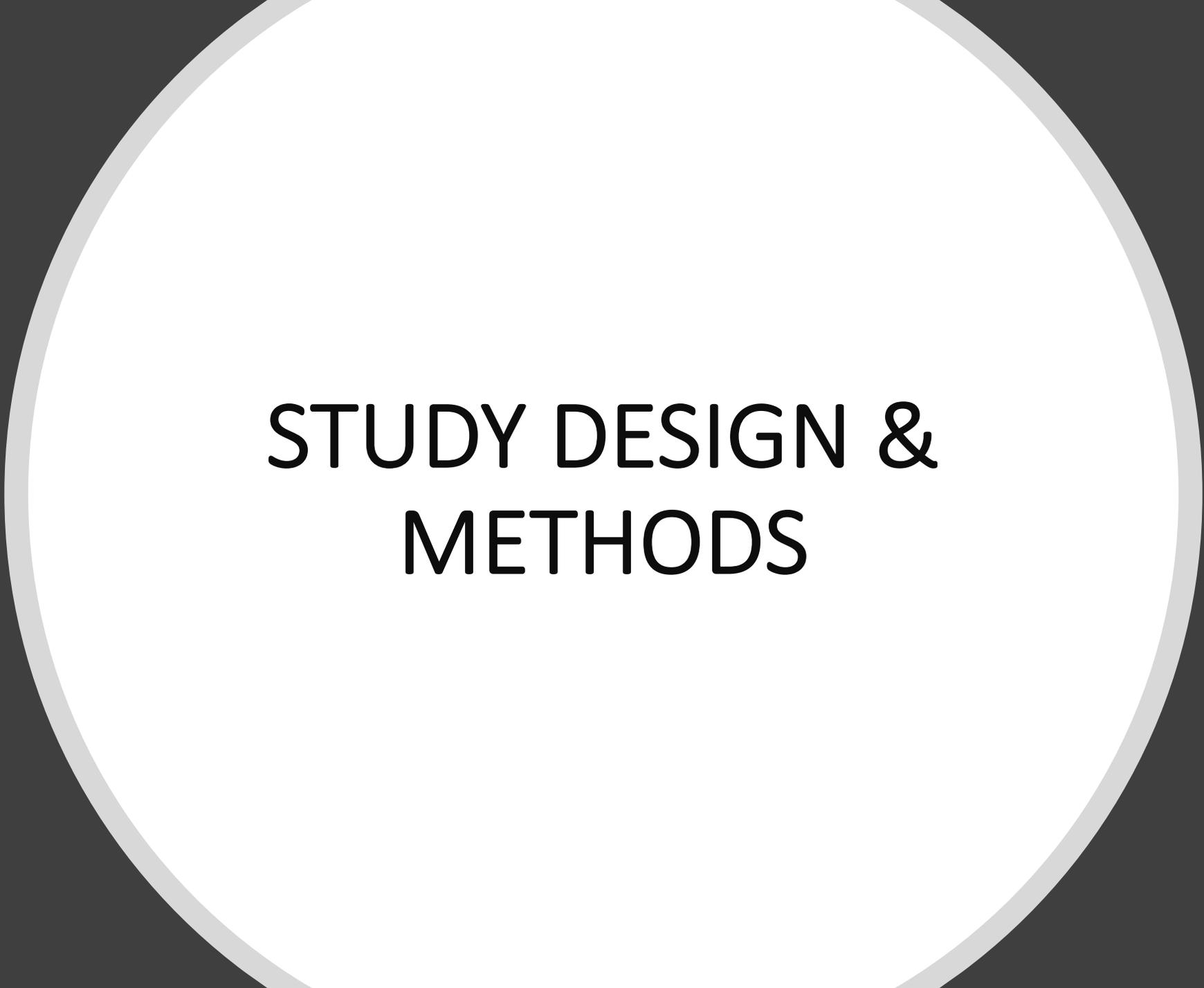
- Current estimates: 63% of rural providers of Maternity care are family physicians
- National decline in number of medical school graduates entering family medicine
- Maternity care education in family medicine has changed
 - most family medicine programs prepare graduates for only normal vaginal deliveries
 - Few include Cesarean delivery training
 - Fellowships are available for Cesarean delivery training

Definitions

- Rural hospital: located in a county or census tract designated as rural by the Health Resources & Services Administration
- Critical access hospital: subgroup of rural hospitals
 - <=25 inpatient beds
 - >35 miles from nearest hospital
 - <= 96 hours avg length of stay for acute care
 - 24/7 emergency care

Study Objectives

- Characterize rural maternity care in a sample of U.S. rural and critical access hospitals
 - What services are offered
 - Who provides those services
- Determine contribution of family medicine physicians to maternity care in rural areas



STUDY DESIGN & METHODS

Study Sample and Survey

- Invited faculty from 22 universities
 - 7 participated covering 10 states
- Administered short survey via phone or print to rural hospitals
- Survey Questions
 - Hospital size
 - Types of maternity services provided
 - Who performed the services
 - Birth data (# of births, provider type)
 - Distance from nearest hospital that provided an essential service

Section 1: Rural or Critical Access Demographic Information

Hospital Name: _____

City: _____ State: _____ Zip: _____

Number of Hospital Beds: _____ Rural: yes / no Critical Access yes / no

Section 2: Maternity Care Provided

Q1. Did you intentionally deliver infants at your facility in any of the years 2013-2017?

Yes No

If 'No' please go to question 1b.

If 'Yes' please go to question 2.

Q1b. Do you provide prenatal care in your town:

Yes No

If 'No' please **Stop. We thank you for providing information on your hospital.**

If 'Yes' please go to question 1c.

Please write the name of nearest hospital that provides prenatal care:

_____ (Address)

_____ (Mileage and time is the above)

Q2. Please list the number of infants delivered at the above named facility for each year is listed below

2013 _____ 2014 _____ 2015 _____

2016 _____ 2017 _____

Q2b. Please enter the number of home births in the service area for the above hospital/facility between 2013-2017 if known.

If you stopped delivering infants in any year during this time please continue with question 2c otherwise, please continue to question 3.

Q2c. Please list the reasons the above facility stopped delivering infants:

Lack of volume

No delivering provider

Lack of anesthesia

Not economically feasible

Liability concerns

Other: _____

Please continue to question 3.

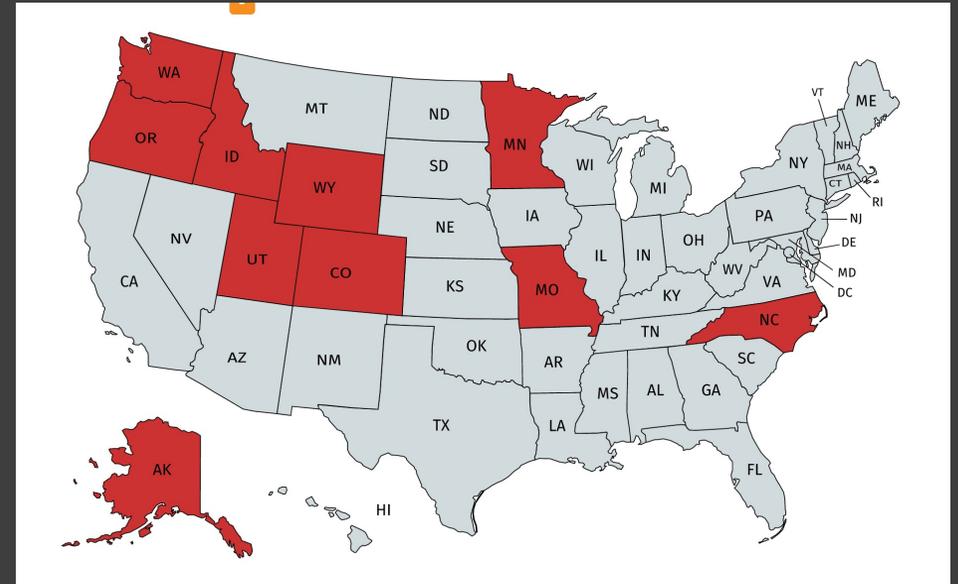
Analyses

- Number of deliveries by family physicians compared to OBGyns and midwives
- Proportion of rural and critical access hospitals where:
 - FPs deliver
 - Cesareans offered
 - VBACs offered
- Distance traveled to receive maternity services not offered in the rural areas

RESULTS

Study Sample

- 216 target hospitals in 10 U.S. states
 - Response: 161 hospitals (74.5%)
 - Information publicly available: 26 hospitals
 - Excluded: 2 hospitals (too much missing info)
- Final cohort: 185 hospitals (85.6% of target)
- All hospitals rural, of which 116 are also critical access



Overall Maternity Care

- Family physicians delivered babies in 67% of hospitals
 - Were the only clinicians delivering in 27% of hospitals
- % hospitals where family physicians delivered babies varied by state
 - North Carolina: <20%
 - AK, MN, UT, WA, WY: >90%
- % hospitals where family physicians were only clinicians delivering babies varied by state
 - WY: 0%
 - WA: 70%

Rural hospitals (n=185) from Participating States (n=10) and Maternity Care Descriptions					
State	# Hospitals	Average # Beds per Hospital (Range)	# Critical Access Hospitals	%(N) Hospitals where FPs and other practitioners deliver	%(N) Hospitals where ONLY FPs deliver
Alaska	13	27 (11-74)	9	92.3% (12)	38.5% (5)
Colorado	19	37 (9-100)	11	73.7% (14)	21.1% (4)
Idaho	7	22 (15-25)	7	85.7% (6)	57.1% (4)
Minnesota*	38	23 (12-25)	38	97.4% (37)	42.1% (16)
Missouri	24	74 (18-244)	7	54.2% (13)	8.3% (2)
North Carolina	37	137 (21-452)	9	16.2% (6)	5.4% (2)
Oregon	22	45 (21-176)	14	59.1% (13)	18.2% (4)
Utah	13	25 (9-54)	9	92.3% (12)	46.2% (6)
Washington*	10	25 (.)	10	90.0% (9)	70.0% (7)
Wyoming	2	25 (.)	2	100.0% (2)	0.0% (0)
Overall	185	57 (9-452)	116	67.0% (124)	27.0% (50)

*Minnesota and Washington provided data for Critical Access Hospitals only

Overall Maternity Care

- Family physicians delivered babies in 67% of hospitals
 - Were only providers delivering in 27% of hospitals

- % hospitals where family physicians delivered babies varied by state

- North Carolina: <20%
- AK, MN, UT, WA, WY: >90%

- % hospitals where family physicians were only clinicians delivering babies varied by state

- WY: 0%
- WA: 70%

Rural hospitals (n=185) from Participating States (n=10) and Maternity Care Descriptions					
State	# Hospitals	Average # Beds per Hospital (Range)	# Critical Access Hospitals	%(N) Hospitals where FPs and other practitioners deliver	%(N) Hospitals where ONLY FPs deliver
Alaska	13	27 (11-74)	9	92.3% (12)	38.5% (5)
Colorado	19	37 (9-100)	11	73.7% (14)	21.1% (4)
Idaho	7	22 (15-25)	7	85.7% (6)	57.1% (4)
Minnesota*	38	23 (12-25)	38	97.4% (37)	42.1% (16)
Missouri	24	74 (18-244)	7	54.2% (13)	8.3% (2)
North Carolina	37	137 (21-452)	9	16.2% (6)	5.4% (2)
Oregon	22	45 (21-176)	14	59.1% (13)	18.2% (4)
Utah	13	25 (9-54)	9	92.3% (12)	46.2% (6)
Washington*	10	25 (.)	10	90.0% (9)	70.0% (7)
Wyoming	2	25 (.)	2	100.0% (2)	0.0% (0)
Overall	185	57 (9-452)	116	67.0% (124)	27.0% (50)

*Minnesota and Washington provided data for Critical Access Hospitals only

Overall Maternity Care

- Family physicians delivered babies in 67% of hospitals
 - Were only providers delivering in 27% of hospitals
- % hospitals where family physicians delivered babies varied by state
 - North Carolina: <20%
 - AK, MN, UT, WA, WY: >90%

- % hospitals where family physicians were only clinicians delivering babies varied by state
 - WY: 0%
 - WA: 70%

Rural hospitals (n=185) from Participating States (n=10) and Maternity Care Descriptions					
State	# Hospitals	Average # Beds per Hospital (Range)	# Critical Access Hospitals	%(N) Hospitals where FPs and other practitioners deliver	%(N) Hospitals where ONLY FPs deliver
Alaska	13	27 (11-74)	9	92.3% (12)	38.5% (5)
Colorado	19	37 (9-100)	11	73.7% (14)	21.1% (4)
Idaho	7	22 (15-25)	7	85.7% (6)	57.1% (4)
Minnesota*	38	23 (12-25)	38	97.4% (37)	42.1% (16)
Missouri	24	74 (18-244)	7	54.2% (13)	8.3% (2)
North Carolina	37	137 (21-452)	9	16.2% (6)	5.4% (2)
Oregon	22	45 (21-176)	14	59.1% (13)	18.2% (4)
Utah	13	25 (9-54)	9	92.3% (12)	46.2% (6)
Washington*	10	25 (.)	10	90.0% (9)	70.0% (7)
Wyoming	2	25 (.)	2	100.0% (2)	0.0% (0)
Overall	185	57 (9-452)	116	67.0% (124)	27.0% (50)

*Minnesota and Washington provided data for Critical Access Hospitals only

Specific Maternity Services: Cesarean

- ~92% of all hospitals performed Cesareans
- FPs performed cesareans at ~46% of hospitals

Rural hospitals (n=185) from Participating States (n=10) and Maternity Care Descriptions			
State	# Hospitals	%(N) Hospitals Offering Cesareans	%(N) Hospitals with FPs performing Cesareans
Alaska*	13	61.5% (8)	46.2% (6)
Colorado†	19	100.0% (19)	47.4% (9)
Idaho‡	7	100.0% (7)	42.9% (3)
Minnesota§	38	92.1% (35)	63.2% (24)
Missouri	24	100.0% (24)	37.5% (9)
North Carolina	37	91.9% (34)	10.8% (4)
Oregon¶	22	95.5% (21)	45.5% (10)
Utah	13	100.0% (13)	84.6% (11)
Washington#	10	80.0% (8)	70.0% (7)
Wyoming	2	100.0% (2)	100.0% (2)
Overall	185	92.4% (171)	45.9% (85)

Specific Maternity Services: VBAC

- ~42% of hospitals offered VBACs
- FPs performed VBACs at ~18% of hospitals

Rural hospitals (n=185) from Participating States (n=10) and Obstetric Care Descriptions			
State	# Hospitals	%(N) Hospitals Offering VBAC	%(N) Hospitals with FPs performing VBACs
Alaska*	13	30.8% (4)	15.4% (2)
Colorado [†]	19	15.8% (3)	5.3% (1)
Idaho [‡]	7	42.9% (3)	28.6% (2)
Minnesota [§]	38	36.8% (14)	26.3% (10)
Missouri	24	58.3% (14)	25.0% (6)
North Carolina	37	56.8% (21)	2.7% (1)
Oregon [¶]	22	18.2% (4)	4.5% (1)
Utah	13	53.9% (7)	46.2% (6)
Washington [#]	10	60.0% (6)	40.0% (4)
Wyoming	2	50.0% (1)	0.0% (0)
Overall	185	41.6% (77)	17.8% (33)

Distance Traveled for Services Not Available Locally

Distance to Nearest Hospital Offering Cesareans Among Hospitals that Don't Offer Cesareans		
Distance (mi)	Frequency	Percent
51-99	1	20.00
100+	4	80.00

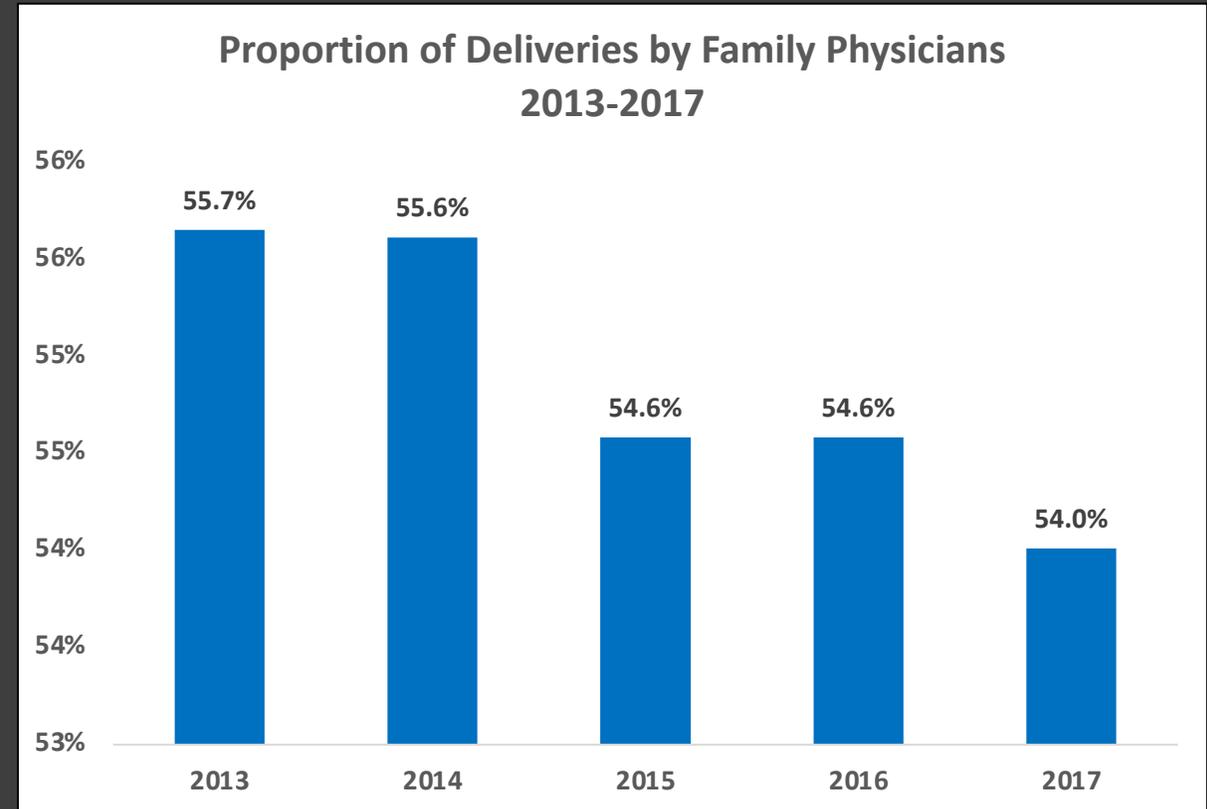
Very few hospitals did not offer Cesareans, but among those that did not, distance to nearest hospital that did was substantial

Distance Traveled to Nearest Hospital Offering VBAC Among Hospitals that Don't Offer VBAC		
Distance (mi)	Frequency	Percent
0-25	15	15.00
26-50	32	32.00
51-99	31	31.00
100+	22	22.00

Among hospitals that do not offer VBAC, distance varied

Proportion of Deliveries by FPs

- number of babies delivered by clinician type available for 77 hospitals (42%)
- % babies delivered by FPs varied by state from 2013-2017
 - Low: 35%
 - High: 100%
- Overall, % babies delivered by FPs was ~54-56% from 2013-2017



Proportion of deliveries by FPs

Proportion of total births performed by Family Practitioners (N=77)																
State	# Hospitals*	Total # Births 2013	# Births delivered by FPs 2013	2013 % of babies delivered by FPs	Total # Births 2014	# Births delivered by FPs 2014	2014 % of babies delivered by FPs	Total # Births 2015	# Births delivered by FPs 2015	2015 % of babies delivered by FPs	Total # Births 2016	# Births delivered by FPs 2016	2016 % of babies delivered by FPs	Total # Births 2017	# Births delivered by FPs 2017	2017 % of babies delivered by FPs
Alaska	5	365	365	100.00%	350	350	100.00%	346	346	100.00%	366	366	100.00%	300	300	100.00%
Colorado	14	2758	1246	45.18%	2855	1177	41.23%	2806	1134	40.41%	2802	1146	40.90%	2537	1011	39.85%
Idaho	5	389	307	78.92%	365	259	70.96%	360	263	73.06%	399	306	76.69%	340	250	73.53%
Minnesota	20	2401	1496	62.31%	2358	1377	58.40%	2428	1300	53.54%	2402	1259	52.41%	2349	1240	52.79%
Missouri	5	1776	882	49.66%	1526	876	57.40%	1485	800	53.87%	1330	698	52.48%	1326	687	51.81%
North Carolina	5	1467	563	38.38%	1378	536	38.90%	1293	581	44.93%	1094	544	49.73%	1185	566	47.76%
Oregon	6	1366	500	36.60%	1226	502	40.95%	1138	434	38.14%	1137	397	34.92%	1101	386	35.06%
Utah	9	1266	904	71.41%	1255	857	68.29%	1237	859	69.44%	1158	795	68.65%	1157	813	70.27%
Washington	7	1361	1018	74.80%	1417	1142	80.59%	1409	1111	78.85%	1341	1023	76.29%	1353	1024	75.68%
Wyoming	1	158	124	78.48%	168	97	57.74%	177	92	51.98%	154	103	66.88%	107	72	67.29%
Overall	77	13307	7405	55.65%	12898	7173	55.61%	12679	6920	54.58%	12183	6637	54.48%	11755	6349	54.01%

*Analysis done on subset of study population with information on births and providers that delivered



CONCLUSIONS

Estimated Impact on Automobile Driving

- Conducted a sub-analysis of driving distances in 29 FP-only hospitals:
 - one-way distance ranged from 15 to 108 miles
 - averaged **43 miles one-way (86 miles round-trip)**
 - estimates excluded de-identified hospitals (16) and extremely remote Alaska hospitals (5)
- Assuming 8 visits for prenatal care and delivery per pregnancy:
 - 23,664 annual automobile round trips
 - At average of 86 miles, 2,035,104 annual miles of driving
 - At 25 miles per gallon, 81,404 gallons of gasoline per year
 - At 58 cents per mile transportation cost (Federal rate), \$1,180,360 in annual transportation cost

Key Findings

Family physicians provide essential access to rural maternity care

- Deliver in most rural hospitals
 - Perform complex deliveries
 - In 50/124 hospitals where FPs delivered (~40%), **FPs were the only type of physicians providing maternity care**
-
- Implication – removing maternity care from FP residency programs will negatively impact access to maternity care for rural Americans



Supporting Rural Maternity Care by Family Physicians

- Family Medicine residencies must include robust maternity care training for graduates destined for rural practice
- Family Medicine residencies and/or fellowships must offer surgical training
- Rural hospitals and practices should devise viable, collaborative practice models among FPs OBGyns and CNMs that preserve rural maternity care and support those providing it
- Family Medicine and OBGyn training programs should collaborate to offer surgical training

Study Limitations and Other Considerations

- Limited sample
 - This study involved tedious, unfunded labor from many collaborating individuals
- Record keeping for births is not uniform across the US
 - Quite a bit of missing data eventually obtained from public sources
 - Many smaller hospitals do not have capacity for higher-level data collection and organization

