ORIGINAL RESEARCH

The Economic Impact of Rural Family Physicians Practicing Obstetrics

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Background: **The economic impact of a family physician practicing family medicine in rural Alabama is $1,000,000 a year in economic benefit to the community. The economic benefit of those rural family physicians practicing obstetrics has not been studied. This study was designed to determine whether there was any added economic benefit of rural family physicians practicing obstetrics in rural, underserved Alabama. The Alabama Family Practice Rural Health Board has funded the University of Alabama Family Medicine Obstetrics Fellowship since its beginning in 1986.**

Methods: **Family medicine obstetrics fellowship graduates who practice obstetrics in rural, underserved areas were sent questionnaires and asked to participate in the study. The questions included the most common types and average annual numbers of obstetrics/gynecological procedures they performed.**

Results: **Ten physicians, or 77% of the graduates asked to participate in the study, returned the questionnaire. Fourteen common obstetrics/gynecological procedures performed by the graduates were identified. A mean of 115 deliveries were performed. The full-time equivalent reduction in family medicine time to practice obstetrics was 20%.**

Conclusions: **A family physician practicing obstetrics in a rural area adds an additional $488,560 in economic benefit to the community in addition to the $1,000,000 from practicing family medicine, producing a total annual benefit of $1,488,560. The investment of $616,385 from the Alabama Family Practice Rural Health Board resulted in a $399 benefit to the community for every dollar invested. The cumulative effect of fellowship graduates practicing both family medicine and obstetrics in rural, underserved areas over the 26 years studied was $246,047,120. (J Am Board Fam Med 2014;27: 602–610.)**

Keywords: **Health Care Economics and Organizations, Obstetrics, Rural Health**

Health care is a major component of a rural economy and a community's finances.[1–3] Quality health care is essential to attract business, industry, and even retirees.[3] Health care in a community affects the economy by affecting employment and income.[3] In many communities, the hospital is a major employer—often the second largest, after the school system.[3] When secondary effects are considered, health care usually accounts for 15% of employment.[2,3] The total effects of health care in a community include physicians, dentists, hospitals, pharmacies, nurses, other health care professionals, and nursing and residential facilities.[3] Family physicians are the primary providers of

This article was externally peer reviewed.
Submitted 3 February 2014; revised 21 May 2014; accepted 2 June 2014.
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Funding: none.
Conflict of interest: none declared.
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Table 1. Annual Rural Economic Impact Per Family Physician by Different Sources

Sources (n)	Revenue	Total Impact
Partners for Rural Health in Alabama (5)	Clinic and hospital	$1,000,000
Eilrich, Doeksen, and St. Clair (2)	Clinic and hospital	$1,532,730
American Academy of Family Physicians (6)	Clinic only	$776,585
Kentucky Rural Health Works Program (4)	Clinic and hospital	$1,677,872
Economic Impact of Noble County, OK (7)	Clinic and hospital	$1,915,912
Doeksen, St. Clair, and Eilrich (8)	Clinic and hospital	$1,800,000
Robert Graham Center (21)	Clinic only	$904,696

Mean total impact of clinics and hospitals = $1,457,956.

health care in rural communities.[2] The economic impact of rural family physicians has been well documented in the literature[2,4–8] and is described in Table 1. The economic benefit of family physicians practicing obstetrics has not been studied. A review of the literature reveals few data on the financial benefit of a rural family physician providing obstetric care.

Economics of Rural Obstetric Care

Obstetric care affects the economic development and sustainability of rural communities.[9] Society benefits from having obstetric services available locally.[10] The availability of maternity care affects young people moving to the community, local businesses, and other medical and hospital services.[9] Retention of maternity care affects the retention of other physicians in the area.[9] Local obstetric care increases the number of other types of patients, such as infants and children.[11]

When maternity care is lost in a community, negative effects occur on many levels.[9,11] Lack of maternity services at a community hospital may affect perception of quality of care.[12] An integral part of rural obstetric care is family physicians providing that care, the loss of which has a significant impact on both the local hospital and community.[4,12] The lack of obstetric care in rural areas leads to a greater incidence of complicated deliveries, preterm deliveries, and higher costs of obstetric care attributed to neonatal intensive care and poor perinatal outcomes.[10] Some communities either cannot support an obstetrics provider or their hospital cannot support a labor and delivery unit,[13] which is associated with local economic losses.[14]

Median salaries and compensation of family physicians versus family physicians practicing obstetrics is listed in Table 2 by several sources.[15,16] Family physicians practicing obstetrics can earn more than family physicians who do not practice obstetrics.[15] The cost of malpractice insurance in Alabama causes only a modest increase in the cost of providing family medicine care compared with a much greater cost for an obstetrician/gynecologist.[17]

Family physicians generate income by caring for patients; they also hire and pay staff to run their offices. Procedures provide revenue that is largely returned to the community, much of which is spent in the community and employment.[12] There are direct effects from the physician and their office staff and from the hospital.[12] A rural primary care physician generates on average $1.5 million in revenue and $0.9 million in payroll and creates 22 jobs.[2] If a physician practices obstetrics, time practicing family medicine must be reduced to allow time for obstetric patients.

Table 2. Median Salaries and Compensation of Family Physicians versus Family Physicians Practicing Obstetrics in 2011 from Several Sources

Source (n)	Family Physicians	Family Physicians Practicing Obstetrics	Increase
MGMA HHS region 4 median salary (15)	$195,974	$227,447	$31,473
MGMA HHS region 4 median compensation (15)	$172,497	$205,517	$33,020
MGMA southern US compensation (15)	$185,945	$238,307	$52,362
Merritt Hawkins average salaries (16)	$178,000	$197,000	$19,000

HHS, Health and Human services; MGMA, Medical Group Management Association.

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Physicians contribute to the hospital's finances by admissions and outpatient procedures.[12] The typical family physician employs 3 full-time employees: a nurse, a medical technician, and a receptionist.[2] Family physicians who practice obstetrics have global obstetric charges and related obstetric and gynecological procedure charges. Deliveries comprise the majority of the procedures performed by family physicians practicing obstetrics. The economic benefits of family physicians practicing obstetrics include employment and income generated by obstetrics in the physician's office, employment and income generated by both inpatient and outpatient obstetrics procedures in the hospital, and secondary employment and income created in the community from the office practice and hospital practice.[12]

University of Alabama Family Medicine Obstetrics Fellowship

The University of Alabama Family Medicine Obstetrics Fellowship was founded at the College of Community Health Sciences in Tuscaloosa, Alabama, in 1986. It is one of the oldest family medicine obstetrics fellowships in the United States. Family Medicine Obstetrics is a 1-year postgraduate fellowship following a 3-year family medicine residency. These fellowships train family physicians to practice full-service obstetrics independently, including spontaneous and instrumental vaginal deliveries and cesarean deliveries and assisting at cesarean deliveries along with bilateral tubal ligation, dilatation and curettage, cervical cerclage, newborn circumcision, and obstetric ultrasound. Fellows also are trained in gynecological procedures such as Mirena/Paragard intrauterine device placement, Implanon/Nexplanon placement, colposcopy with biopsies, loop electrosurgical excision procedure, cervical conization, laparoscopic tubal ligation, endometrial biopsy, cryotherapy, and incision and drainage of a Bartholin gland abscess. This training program has the highest rate of rural placement of graduates in the country: 65% of graduates practice obstetrics in rural, underserved areas.[18] The Alabama Family Practice Rural Health Board has funded this fellowship since its beginning with $616,385 over the past 26 years. This study examines the economic impact of family physicians practicing obstetrics in underserved, rural areas.

Materials and Methods

This study was approved by the institutional review board of The University of Alabama. Data were taken from the Department of Obstetrics and Gynecology and Family Medicine Obstetrics Fellowship Program records and contact information at the College of Community Health Sciences. Fellowship graduates who practice obstetrics in rural areas were contacted and offered participation in this research project. A questionnaire then was sent to those graduates. Name, year of graduation, responses, hospitals, and location of practice were de-identified to maintain confidentiality. The questions included the annual average number of deliveries, obstetric/gynecological (OB/GYN) hospital procedures, and office procedures.

Dr. Gerald Doeksen is considered a national authority on rural health economics and is highly published in this area. We consulted Dr. Doeksen about our study, and he made recommendations that we used. A model for this research was based on the study of the productivity of general surgeons in rural areas by Eilrich et al[12] because both surgery and obstetrics are procedure based with global reimbursement in contrast to evaluation and management and preventive medicine codes of other specialties. Sumter County, Alabama, has been studied by the National Center for Rural Health Works and data published in the National Association of Counties Project.[19] It is a rural county typical of rural Alabama, with a population of 14,798 according to the 2000 Census.[20] Because Sumter County is typical of rural Alabama, economic multipliers for that county were used in this study. Medicaid is the primary health insurance for most reproductive-aged women in rural, underserved areas, although there are a few patients with private health insurance with obstetric coverage. Because it is the lowest reimbursement for obstetric services, the reimbursement for Medicaid was used in this study in an effort to avoid overestimating reimbursement.

The estimate of economic benefit of primary care physicians from Partners for Rural Health[5] was used because it was the lowest estimate of physician benefit (Table 1). Economic multipliers represent the added effect of generated money cycling through the community as a result

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Table 3. Output Multipliers of Selected Rural Hospitals and Physician Clinics

Source (n)	Hospital	Clinic
Rural primary care physicians (2)	1.32	1.37
Rural general surgery (12)	1.33	1.33
Sumter County, Alabama (20)	1.28	1.15
Oklahoma rural counties (3)	1.99	1.47
Measuring economic importance (32)	1.43	1.31
Smith County, Kansas (22)	1.18	1.12
Rural critical care hospitals (23)	1.24	—
Humboldt County, Nevada (24)	1.24	1.22
Big Sandy Area (25)	1.29	—
Rural Nebraska (31)	1.58	1.44
Health care sector in Kansas (27)	1.48	1.40
Atoka, Oklahoma (28)	1.47	1.34
Douglas County, Nevada (29)	1.25	1.22
Hamilton County, Illinois (30)	1.31	1.24
Range	1.18–1.99	1.12–1.47

of a particular service.[3,12] A multiplier effect is a measure of the effect of an increase or decrease in economic activity.[21] Thompson[14] estimated that for every 100 rural hospital employees, another 58 jobs were created in the community. Because Sumter County is typical of rural Alabama, those reported multipliers were used in this study. The income multiplier for hospitals is 1.28[19] and for physicians is 1.15.[19] These are comparable to multipliers of rural communities found in the literature,[2,3,12,20–30] which are listed in Table 3. In a study by Doeksen et al,[19] county or community income multipliers range from 1.2 to 1.8, whereas regional or state multipliers are >2. Multipliers are higher in urban areas and lower in rural areas.[30]

Results

Eighteen physicians matriculated in the program and 17 completed the program. Thirteen fellowship graduates practicing obstetrics in rural, underserved areas were asked to participate in the study. One graduate could not be contacted. Responses were obtained from 10 of 13 physicians (77%), 9 (90%) of whom practiced obstetrics in rural Alabama. One physician who did not respond to the questionnaire during the study later provided the average number of deliveries each year and the years practiced in family medicine and obstetrics. The numbers of years of practice in both family medicine and obstetrics were obtained from the departmental records of 2 physicians who did not respond and the one who could not be contacted. The years of practice of these 3 physicians were used only to compute total years of practice in family medicine and obstetrics.

From a list of 17 OB/GYN procedures commonly taught in family medicine obstetrics fellowships (Table 4), the 10 physicians estimated the number of each procedure they performed annually based on their records (Table 5). Fourteen commonly performed OB/GYN procedures performed by family physicians practicing obstetrics included total vaginal and cesarean deliveries, assists at cesarean deliveries, dilatation and curettage, loop electrosurgical excision procedures, cervical conization, endometrial biopsy, cryotherapy of the cervix, colposcopy with biopsies, Implanon/Nexplanon placement, Mirena and Paragard intrauterine device insertion, postpartum bilateral tubal ligation, incision and drainage of Bartholin gland abscess, newborn circumcision, and office ultrasound. Cervical conization, laparoscopic

Table 4. Common Procedures Performed by Family Physicians Practicing Obstetrics

CPT Code	Description	Physician Charge	Medicaid Reimbursement
54900	Delivery	$2760	$1390
59510–80	Assist at cesarean delivery	$911	$0
58120	Dilatation & curettage	$549	$170
57522	LEEP	$693	$176
57520	Cervical conization	$723	$211
57511	Cryotherapy cervix	$172	$99
57454	Colposcopy/biopsies	$225	$108
58100	Endometrial biopsy	$139	$76
J7307	Implanon/Nexplanon placement	$874	$659
J7302	Mirena placement	$899	$703
J7300	Paragard placement	$750	$598
58605	Postpartum tubal ligation	$931	$432
56420	I&D Bartholin gland abscess	$160	$94.50
54161	Newborn circumcision	$254	$172
—	Ultrasound*	$150	$100

*$100 for providing ultrasounds regardless of how many are performed.
CPT, current procedural terminology; I&D, incision and drainage; LEEP, loop electrosurgical excision procedure.

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Table 5. Table of Physician Procedures*

	1	2	3	4	5	6	7	8	9	10
Procedure										
Deliveries	120	88	200	100	100	60	120	60	120	78
Assist cesarean delivery	30	18	—	25	—	—	12	80	12	15
Dilatation and curettage	20	10	20	6	2	2	10	5	8	1
LEEP	—	20	—	8	—	3	—	5	—	—
Cervical Cone	—	—	—	—	—	—	—	—	—	—
Cryotherapy	—	20	15	—	50	—	—	—	—	—
Endometrial Biopsy	12	5	10	12	—	20	—	20	3	1
Colposcopy	50	35	34	40	120	30	15	20	15	104
Nexplanon	100	—	5	—	1	60	—	30	—	—
Mirena	50	2	20	24	—	50	20	20	20	50
Paragard	5	—	2	12	—	2	—	—	—	0
Postpartum BTL	25	25	30	12	20	2	5	10	3	—
Laparoscopic BTL	—	—	—	—	—	—	—	—	—	—
I&D BGA	15	5	10	3	10	2	2	—	2	52
Cerclage	—	—	—	—	2	1	—	—	—	—
Circumcision	60	44	100	36	—	20	60	30	60	50
Ultrasound	120	300	600	200	100	780	120	60	120	—

*Physicians are in no particular order.
BTL, bilateral tubal ligation; I&D BGA, incision and drainage Bartholin gland abscess; LEEP, loop electrosurgical excision procedure.

tubal ligation, and cerclage were excluded from the study because of small numbers. While these estimates were subjective, many were similar. The range of deliveries was 60 to 200, with a mean of 115 deliveries per year. The numbers of procedures were estimated by the individual physician, usually with the assistance of the office manager.

Medicaid reimbursement for physicians was obtained from the certified coding professional at University Medical Center at the College of Community Health Sciences. Medicaid reimbursement for hospitals was obtained from the chief financial officer at DCH Regional Medical Center in Tuscaloosa, Alabama. Medicaid reimbursement was used for calculations because it is by far the most common method of coverage. We also did not want to overestimate the physician reimbursement. Seeing obstetric patients necessitates some reduction in family medicine patients. Not all physicians responded to the percentage of full-time equivalent reduction in family medicine patients to accommodate obstetric patients. Among those who responded, the most common full-time equivalent reduction reported by the more experienced physicians was 20%. Those who had been in practice only for a short period of time were uncertain of the time involved and could only provide a rough estimate.

Average annual totals of the 14 procedures among the 10 physicians were obtained. The number of each procedure was multiplied by the reimbursement for both the physician and the hospital. A sample computation for one physician is illustrated in Table 6. The total reimbursements for both clinic and hospital were multiplied by the appropriate multipliers, producing a total impact for that physician. The total economic impact for all 10 physicians is illustrated in Table 7. The total of the individual physician impact was obtained, and the mean was $688,560. The average economic impact on the community of a family physician practicing obstetrics in a rural, underserved area is $688,560 a year (Table 8). The average economic impact on the community of a family physician practicing family medicine in rural Alabama is $1,000,000 a year.[5] When that impact is reduced to $800,000 to allow time to see obstetric patients and $688,560 is added for practicing obstetrics, the annual economic impact of practicing family medicine and obstetrics is $1,488,560 (Table 8). Practicing obstetrics in ru-

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Table 6. Sample Computation of One Physician

	Number	Physician Reimbursement	Physician Total	Hospital Reimbursement	Hospital Total
Procedure					
Deliveries	200	$1,390	$278,000	$3,100	$620,000
Assist cesarean delivery	—	—	—	—	—
Dilatation and curettage	20	$170	$3,400	$274	$5,480
LEEP	—	—	—	—	—
Cervical Cone	—	—	—	—	—
Cryotherapy	15	$94	$1,410	—	—
Endometrial Biopsy	10	$76	$76	—	—
Colposcopy	34	$108	$3,682	—	—
Nexplanon	5	$659	$3,295	—	—
Mirena	20	$703	$14,060	—	—
Paragard	2	$598	$1,196	—	—
Postpartum BTL	30	$432	$12,960	$0	$0
Laparoscopic BTL	—	—	—	—	—
I&D BGA	10	$94	$940	$61	$610
Circumcision	100	$172	$17,200	$303	$30,300
Ultrasound	600	$100	$20,000	—	
Subtotal			$356,903		$656,390
Physician multiplier of 1.15 × $356,903 =			$410,438		
Hospital multiplier of 1.28 × $656,390 =			$840,172		
Total for physician and hospital =			$1,250,617		

BTL, bilateral tubal ligation; I&D BGA, incision and drainage Bartholin gland abscess; LEEP, loop electrosurgical excision procedure.

ral areas adds an additional $488,560 in economic benefit to the community.

The Department of Obstetrics and Gynecology maintains ongoing records of family medicine obstetrics fellowship graduates. The number of years of family medicine and obstetrics service for physicians who did not respond, responded late, or could not be contacted were used to estimate the total economic impact for all physicians practicing family medicine and obstetrics in rural, underserved areas. The total impact of family medicine was 184 years multiplied by $1,000,000 year/physician, which yielded $184,000,000. The total impact of obstetrics was

Table 7. Total Economic Impact of Physician's Clinic and Hospital Revenue with Multipliers

Physician*	Clinic	Multiplier	Physician Total	Hospital	Multiplier	Hospital Total	Total Impact
1	$310,762	1.15	$357,376	$396,560	1.28	$507,597	$864,973
2	$202,110	1.15	$232,427	$376,016	1.28	$481,300	$714,685
3	$356,903	1.15	$410,438	$656,390	1.28	$840,179	$1,250,617
4	$182,206	1.15	$209,537	$325,015	1.28	$416,019	$625,556
5	$171,655	1.15	$197,403	$314,008	1.28	$401,930	$599,333
6	$175,406	1.15	$ 201717	$192,730	1.28	$253,094	$454,411
7	$197,076	1.15	$226,375	$393,042	1.28	$503,094	$729,731
8	$122,540	1.15	$140,921	$197,885	1.28	$253,293	$394,214
9	$196,848	1.15	$226,375	$393,042	1.28	$503,094	$729,469
10	$169,832	1.15	$195,307	$260,396	1.28	$333,307	$528,613
						Total:	$6,885,602
						Mean:	$688,560

*The physicians are in no particular order.

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Table 8. Computation of the Average Economic Impact from Rural Family Physicians Practicing Obstetrics

Annual economic impact of practicing family medicine	$1,000,000
20% FTE reduction in family medicine for practicing obstetrics	−$200,000
Annual economic impact of practicing family medicine at 80%	$800,000
Annual economic impact for practicing obstetrics	+$688,560
Annual economic impact of practicing family medicine and obstetrics	$1,488,560*

*$1,000,000 − $200,000 = $800,000 + $688,560 = $1,488,560.
FTE, full-time equivalent.

127 years multiplied by $488,560 year/physician, yielding $62,047,120. The total impact for both was $246,047,120 (Table 9).

Discussion

Rural family physicians practicing obstetrics add an additional $488,560 in economic benefit to the community served. This produces an annual economic impact of practicing family medicine and obstetrics of $1,488,560. The cumulative effect of family physicians practicing obstetrics in rural, underserved areas over the all respondents' years of practice is $62,047,120. The total investment of $616,385 from the Alabama Family Practice Rural Health Board has resulted in a 399% investment return, or a $399 benefit to the community for every dollar invested. The total impact for both family medicine and obstetrics was $246,047,120. Rural family physicians practicing obstetrics produce an economic benefit to the communities in which they practice. This investment has had a significant positive effect on the economy of the rural communities. We believe this benefit is reproducible in other communities. The investment in this fellowship has placed physicians in rural, underserved areas, has paid off, and has benefitted the people of Alabama.

While this study is limited by the small number participants, the response rate among physicians was 77%. Larger studies are needed to confirm these estimates. This study used physician clinic and hospital revenue estimates to compute economic impact. A more complete study would include both wage income and employment data. This study excluded fellowship graduates who chose to practice in urban areas. In summary, investment in rural family medicine obstetrics seems to economically benefit the communities.

Table 9. Total Economic Impact of Practicing Rural Family Medicine and Obstetrics*

Physician	Years in Family Medicine†	×$1,000,000	Years in Obstetrics‡	×$488,560	Physician Total
1	10	$10,000,000	10	$4,885,600	$14,885,600
2	21	$21,000,000	16	$7,816,960	$28,816,960
3	2	$2,000,000	1	$488,560	$2,488,560
4	15	$15,000,000	14	$6,839,884	$21,398,840
5	9	$9,000,000	8	$3,908,480	$12,908,480
6	3	$3,000,000	2	$977,120	$3,977,120
7	30	$30,000,000	22	$10,748,320	$40,748,320
8	22	$22,000,000	5	$2,442,800	$24,442,320
9	8	$8,000,000	7	$3,419,920	$11,419,920
10	11	$11,000,000	10	$4,885,600	$15,885,600
11§	18	$18,000,000	4	$1,954,240	$19,542,240
12‖	20	$20,000,000	19	$9,282,640	$29,282,640
13‖	15	$15,000,000	9	$4,397,040	$19,397,040
Total	**184**	**$184,000,000**	**127**	**$62,047,120**	**$246,047,120**

*Physicians in no particular order.
†Years of practice of family medicine.
‡Years of practice of obstetrics.
§Reported after completion of study.
‖Did not respond but numbers of years of practice obtained from departmental records.

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The authors thank Charla Mills, CPC, COBGC, for providing CPT Coding and Medicaid reimbursements; Nina Dusang, CPA, for providing average salaries for hospital employees and Medicaid reimbursement to hospitals; Dr. John R. Wheat for data on the economic benefit from Alabama physicians; Dr. Gerald Doeksen and Fred Eilrich for help with structuring the research; Charlyn Treese for physician salaries from Medical Group Management Association/American College of Medical Practice Executives; Phillip Miller for physician salaries from Merritt-Hawkins; and Ellen Stone from the Alabama Family Practice Rural Health Board.

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