

FACTORS AFFECTING THE PERFORMANCE OF MATERNAL HEALTH CARE PROVIDERS IN ARMENIA

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Abstract

Background

Over the last five years, international development organizations began to modify and adapt the conventional *Performance Improvement Model* for use in low resource settings. This model outlines the five key factors believed to influence performance outcomes: *job expectations, performance feedback, environment and tools, motivation and incentives, and knowledge and skills*. Each of these factors should be supplied by the organization in which the provider works, and thus, *organizational support* is considered as an overarching element for analysis. Little research, domestically or internationally, has been conducted on the actual effects of each of the factors on performance outcomes and most PI practitioners assume that all of the factors are needed in order for performance to improve. This study presents a unique exploration of how the individual factors, as well as the factors in combination, affect the performance of primary reproductive health providers (nurse-midwives) in two regions of Armenia.

Methods

Two hundred and eighty-five nurses and midwives were observed conducting real or simulated antenatal and postpartum/neonatal care services and interviewed about the

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presence or absence of the performance factors within their work environment. Results were analyzed to compare average performance with the existence or absence of the factors; then, multiple regression analysis was conducted with both datasets to obtain the best models of “predictors” of performance within each clinical service.

Results

Baseline results revealed that performance was sub-standard in several areas and several performance factors were nonexistent. The multivariate analysis showed that (a) training in the use of the clinic tools; and (b) receiving recognition from the employer or the client/community, are factors strongly associated with performance, followed by (c) having clear expectations from a job description, and (d) receiving performance feedback.

Conclusion

This study concludes that the antenatal and postpartum care performance of health providers in Armenia is strongly associated with having the practical knowledge and skills to use everyday tools of the trade and with receiving recognition for their work, as well as having clear job expectations and feedback. The paper recognized several limitations and expects further studies will illuminate more on this important topic.

Background

Training and service delivery organizations have tried for decades to improve the quality and access of healthcare services in developing countries by providing training to health care providers. The assumption has been that the gap in providers’ performance is attributable to inadequate knowledge and skills—and therefore, training is what is called for. Millions of training dollars later, healthcare indicators are little improved, and providers are still in need of support. [1]

Realizing that training is not the only solution, organizations such as IntraHealth International have searched for the key to improving outcomes, and looked to domestic research and new developments in Human Performance Technology (HPT) to guide them. HPT experts have long established that people's optimal performance is predicated on having support in a variety of areas, including: (1) clear job expectations; (2) timely performance feedback; (3) adequate environment and tools; (4) internal motivation and/or external incentives; (5) knowledge and skills; (6) capacity to do the job.

IntraHealth/PRIME II adapted this list of factors to the international development field, subtracting 'capacity' and adding 'organizational support' to address inadequacies in the other five areas, such as supervision to deliver feedback and clarify expectations for providers. With these premises at hand, organizations have recently developed and utilized the Performance Improvement (PI) approach to improve provider performance and project interventions. [2-7]

The logic of looking at workers' overall environment when analyzing productivity has been widely documented [8]. There is little empirical research however, exploring the relationships between worker performance and the performance factors, and even less in developing or newly-independent countries. One of the few domestic studies was carried out by Hwang using a mail survey among employees and supervisors at the Office of the Inspector General in the Florida Department of Children and Families. Using an elaborate framework of five components of performance (quantity, quality, efficiency, problem-

solving capacity and adaptability) and seven performance factors (performance specification, capacities, knowledge and skills, job/task design, incentives, feedback and resources and tools), he finds that in the employees' questionnaire, **feedback** is related to performance, in particular the **efficiency** dimension of performance. Though there are relationships between the factors and performance, in the questionnaires filled out by supervisors, results are less definite. Among the limitations of the study is that its cross-sectional design precluded making cause-effect inferences.[9]

This study uses a simple framework: it assumes that human performance is facilitated and/or hindered by the 'performance factors' listed above and hypothesizes that not all factors are equal in their effects on performance. The objective of the study is to determine which factor(s) have a higher association with provider performance (See study framework in Figure 1). Although human performance is comprised of both behavior and its accomplishments, [10] for this study only the behavioral component of performance is investigated and will be determined through observation of health worker's realization of job tasks.

Methods

The study was conducted in Armenia as an extension to a baseline assessment of provider performance to inform the implementation of a USAID-funded project to improve maternal and neonatal health. It constituted a facility-based survey drawing on a sample of nurses and midwives working at three types of service delivery points: polyclinics, health centers and primary posts or FAPs. Consenting health care providers and clients were observed during two kinds of reproductive health services (prenatal and postpartum

care) while trained clinical data collectors recorded the completion of clinical and non-clinical tasks using a checklist derived from the MEASURE *Evaluation's* Quick Investigation of Quality (QIQ) tool.[11] Because it was not always possible to observe a real client visit, providers were sometimes asked to simulate a situation with a second interviewer standing in for the client. After the provider was observed, she was interviewed about her work environment and the other performance factors.

Using the StatCalc feature of Epi Info 6.04, the desired sample size was estimated to be 300 based on a total provider population of 3000; an expected frequency of 40% (average performance for clinical skills); a worst acceptable error of 15%; a confidence level of 95%; and a 10% margin for loss of data. The final number of providers observed and interviewed was 285.

Teams of two data collectors, an observer (gynecologist-obstetrician) and an interviewer (non-clinician), were trained in completing the checklists, interviewing, and simulating a client situation where no client was available. Instruments were first translated into Armenian and pre-tested for consistency and comprehensibility. Supervisors ensured correct application and completion of instruments and a field coordinator organized all logistics and performed quality control of the field work.

⁴ Based on the MEASURE Quick Investigation of quality (QIQ) tool (MEASURE, 2001)

⁵ Initial analyses distinguished between real and simulated interactions and their results are presented in the following section.

⁶ Epi Info, StatCalc calculations

The average performance score for each provider was compared to the dichotomous answers received from the performance factor questionnaire. The resulting significant factors were entered into a stepwise multiple regression model to discover which factor(s) would become better overall predictors of performance. Some background variables, such as clinic type, provider's age and years working at the facility were added to the model.

RESULTS

Provider characteristics

All respondents, but one, were female and 82 percent were married at the time of the interview. With a median age of 42, they had worked in reproductive health on average for 20 years, with 14 years on average at the interview facility.

Prenatal care skills

The prenatal care checklist included 42 tasks to perform during each client visit. Performance was substandard across the board (average 38 percent of the total possible score) with acutely low scores in several triage and clinical areas such as “Washes hands with soap and water and dries them” and “Takes temperature” and counseling areas such as “Informs woman of positive and side effects of medicines during pregnancy” (see Table 1).

⁷ The authors are aware that only the **behavior** component of performance will be ascertained, since strictly speaking performance is both the combination of provider behavior plus accomplishments (Fort, 2002).

Postpartum care skills

The postpartum skills checklist included 37 tasks to perform during the client visit. Again, performance was substandard, although slightly higher than the prenatal care results (51 percent of the total possible score) (See Table 2).

The performance factors- Are they present or absent?

Clear Job Expectations

Almost 7 of 10 providers lacked job description; when asked how they knew what to do for their jobs, 9 percent answered “through oral explanation from the supervisor or other person.” When providers were asked whether standards for their performance had been set (i.e. they were told *how* they should do their job), 78 percent responded affirmatively; in further questioning, 37 percent stated having guidelines, 35 percent other written material, and 21 percent had protocols.

Motivation and incentives

Asked whether providers received bonuses or raises for good performance, 92 percent of nurses/midwives responded negatively. Asked what types of non-monetary incentives they received, providers working in prenatal care (clinic-based), responded: “verbal recognition from supervisors” (44.3%), followed by “training courses” (21.3%), and “free/reduced medicine” (14.6%). Providers offering postpartum care (community-based)

⁸ This verbal recognition is frequently expressed by doctors to nurses/midwives when they ‘trust’ them to carry out a task not usually done by nurses/midwives, as found in the qualitative study.

responded “verbal recognition from clients or the community” (36.3%), closely followed by “respect in the community” (31%), “in-kind products” (e.g. pack of coffee, chocolate bar) (19 %), and “services in return” (e.g. cutting firewood, farming, etc .) (11.4 %).

Feedback on performance

A large majority of nurses/midwives (95%) stated they had received “feedback about [their] job performance.” When probed on the characteristics of the feedback, nearly all answers considered it work-related (99.6 %), related to standards and not to behavior (93.6%), immediate and frequent enough to help remember what they did (92.8%), selective and specific (92.5%), and positive and constructive (93.2%). When asked for an example of the feedback, however, nearly two-thirds cited occasions when a supervisor or a doctor had praised them for some good deed, indicating that what was considered to be feedback could also be considered verbal recognition. When asked from whom they received the “feedback”, 600 answers listed a range of sources, from clients and colleagues, to the mayor’s office.

Organizational support

When asked if they had received performance reviews from supervisors, 64 percent said they had; in describing the reviews, more than 80 percent said they were oral and informal exercises.

⁹ This is consistent with the qualitative study, where apparently patients are quoted as being the most important source of any feedback to nurses/midwives, either to them directly or through doctors (supervisors, often) when visiting their

Supervision visits occur frequently, according to respondents: 94 percent of providers had received a supervisory visit during the previous 6 months. Visits often lasted over 2 hours, with physicians providing services such as specialty consultations or vaccinations. Though supervision was often and quite long, 86 percent of providers characterized supervisors' tasks as administrative (e.g. "checks forms, vaccinations,") and 24 percent as clinical ("sees patients and works in the clinic,"). In less than 10% of responses, the supervisor was said to have provided feedback on performance. This finding is perhaps explained by administrative visits by nurses and occasional clinical consultations by visiting physicians.

Environment (tools and equipment) and work organization

Asked if their workplace was adequate, 76 percent said "yes", although only 40 percent said it was "comfortable". Nearly 60 percent of providers said they did not have the tools "to do the job well." When asked what equipment was needed, First Aid medicines (13.5%), surgical instruments (10.5%) and scales (9.4%) were listed, averaging 2.8 items mentioned per individual.

As a follow-up question on the availability of equipment and tools, providers were asked if they had been trained in the use of the clinic tools —nearly 75% said they had been.

¹⁰ However, it has to be said that working with a supervisor in the same facility does not mean necessarily the worker receives proper supportive *supervision*. Hence, this high figure should be interpreted with caution.

The last area explored was whether the provider was satisfied with the way the work was organized. Most respondents (75%) answered “yes” to this question.

Knowledge and skills

Forty percent of providers had not received any training in reproductive health. Of those trained, about one third had attended a course in 2002, with the majority attending in 2000. Most providers (82%) believed they had the necessary knowledge and skills to do their job and 97% of them claimed to be able to apply what they had learned to their work.

Relationships between Performance Factors and Actual Performance

Among the 19 variables representing all the performance factors, 11 were found to have a significant relationship to performance (see Table 3). The most significant are:

- *Having a job description*
- *Receiving non-monetary incentives, from the employer and from the community;*
receiving bonuses or raises, opportunities for promotion and disincentives are found not to be related to performance.
- *Being satisfied with the organization of the work;*

- *Having the necessary equipment, instruments and supplies* was only critical to performance for prenatal care.
- Three of four variables in knowledge and skills were found to be significant with prenatal and postpartum care performance: if the provider *believes [he/she] has the necessary skills to do the job*, whether they have *received training in RH* and having been *trained in the use of clinic tools* appear significantly related to all scores.
- *Receiving performance reviews*

Appropriate feedback does not reach significance by close margin ($p=0.047$ and $p=0.05$) while the more direct question on whether the *provider receives feedback about his/her performance* was not found to be influential.

Whether the *provider received supervision in the last 6 months* was related to performance only in the area of prenatal care. The *kind of supervision*, on the other hand, produced some small differences only in the area of prenatal care, which did not reach statistical significance.

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¹² This last variable was originally placed in the “work organization and environment factor. However, since it explicitly asks for training it was moved to the “knowledge and skills” category.

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¹⁵ Consistent with the finding above, prenatal care seems to rely more on equipment than PPC, which is often done through home visiting.

Multivariate analysis

Variables significantly associated with performance at the bivariate level were selected as independent variables in multiple regression analyses of performance (the dependent variable). Analyses were done for both prenatal and postpartum care performance.

Prenatal care and Performance

Eleven of the 21 performance factor variables had a significant relationship with prenatal performance and were included in the linear regression analysis, as well as the three background variables of importance (age, years working in the facility and facility type). Results appear in Table 4.

The table shows that 3 of the 14 variables entered into the regression equation became best predictors of performance in this clinical area. These are, in order of importance (based on the standardized β coefficients), the *type of clinic* the provider works in, whether the provider *[has] been trained in using the tools* and *receives non-monetary incentives from the employer*. The adjusted R Square for the model is 0.09.

Postpartum care and Performance

There were also eleven significant variables affecting postpartum care performance at the bivariate level, and three background variables which were included in a stepwise multiple regression as before. Table 5 presents the results obtained.

¹⁶ This last variable was originally placed in the “work organization and environment factor. However, since it explicitly asks for training it was moved to the “knowledge and skills” category.

This time, the regression analysis yielded four predictor variables. Using the Beta coefficient as a measure of relative order, *[has] been trained in using the tools* is the strongest predictor for postpartum care, followed by *receives non-monetary incentives from the community*. A third variable of significance, *has received performance reviews*, is followed by whether the provider *believes [he/she] has the necessary skills to do the job*. The adjusted R Square for this model is 0.13.

DISCUSSION

The first important finding of the study is the statistical significance of the relationships between performance and the performance factors. On the one-to-one relationships, 11 of the 21 variables tested had a significant effect on performance and more importantly, 7 of the 11 variables were the same for both clinical areas. They are:

Job expectations

1. having a job description,
2. having had performance reviews,

Motivation/incentives

3. receiving non-monetary incentives (from the employer),
4. receiving non-monetary incentives (from the community),

Knowledge and skills

5. having been trained in the use of tools [for the job],
6. believing to have the necessary skills for the job, and
7. having received training in RH.

A second key finding is that multiple regression finds performance factors associated with performance in two clinical maternal health areas: three factors with the area of prenatal care and four factors in postpartum care (see Table 6).

It is clear that for prenatal care, the *type of facility* in which the provider works is definitely associated with performance. This same variable does not exert any influence over performance in postpartum care. This is largely due to the fact that nurses and midwives who work at the higher polyclinic level provide more clinical services than those at FAPs. They also receive better support in supervision and facility maintenance. The same does not hold true for postpartum care. Most providers working in FAPs contact and refer pregnant women to these higher level clinics for service. *Training in the use of clinic tools and equipment* and *verbal recognition by employer or community* are predictors for both areas of performance—quite a finding for the study. For postpartum care performance, having a *written job description* and having *performance reviews* also predicts performance.

CONCLUSIONS

Although further studies of this nature are needed to confirm the relative importance of factors, in this study it is interesting to find that it is not so much the theoretical knowledge but the practical application of skills in the use of everyday clinic tools that

associates with improved performance. This finding seems to reinforce the need for ‘essential learning’ approaches for improved performance that several training organizations, including IntraHealth, are developing for use in developing countries.

A second predictor of importance is *receiving non-monetary incentives* by either providers’ employers or the community for whom they work. In a context of economic hardship affecting fair and prompt payment of salaries to health workers such as in Armenia, non-monetary incentives in the form of recognition, in-kind contributions, community respect and assistance with services can become powerful motivators to enhance performance.

For postpartum care, finding that *having a written job description and a performance review* from a supervisor predicts performance suggests that these tools are most important when people work in less structured environments, often working away from the clinic or the office.

Limitations

Several caveats to the study should be mentioned. First, the cross-sectional nature of the study, and corresponding associations found, do not imply causal relationships between the factors and provider performance. Though questions related to performance factors

¹⁷ This finding is in direct relevance to PRIME’s efforts of studying what is the **Essential Learning** contents and media providers need to perform appropriately in resource poor environments.

¹⁸ It has to be borne in mind that the term “improved care” is used in the relatively sense, since this baseline assessment has found particularly low levels (especially of nurses/midwives in PNC) of health care.

were asked with a retrospective connotation (e.g. “in the past 6 months, have you received any supervisory visit?”), memory recall and rationalization may curtail providers’ recollection of factors affecting their performance. The multivariate analyses has been carried out by merging data from two different exercises and data collectors, thus arguably adding variation (and a degree of error) to the usual limitations.

A second note of caution comes from the inherent difficulty in the application of the factors questionnaire by interviewers, the respondents’ comprehension of topics with Western connotations, and the added difficulty of interpretation and translation of perceptions (e.g. what providers answered as “feedback” seems to have been other types of interaction).

We have also used a “proxy” of performance, through the observation of skills. There are other components of performance (e.g. accomplishments) not included in the study. The low R square rates obtained means our model has captured only a small percent of the total variation, suggesting that there might be several other factors associated with performance or perhaps better instruments/methods to ascertain it. In addition, there is the added bias associated with the “Hawthorne effect” of having a third person in the room affecting the provider’s otherwise typical performance. Finally, preliminary analyses (not shown) revealed that our measures of performance varied somewhat between real and simulated scenarios in the case of post-partum care, though not with prenatal care, thus prompting questions about the generalizability of some of the results.

Further replication of this study (planned for Nigeria and Bolivia) should shed light about the relative importance of factors in other contexts. Their results can assist development efforts involving human resources by focusing on priority areas, and save valuable financial resources.

List of Abbreviations

FAP- Health Center or prime post

HPT- Human Performance Technology

PI- Performance Improvement

Competing interests

None to declare

Author's contributions

Alfredo Fort designed the study, analyzed and interpreted the data and wrote a first draft of results. Lauren Voltero provided the *Performance Improvement* framework and definitions, wrote and edited substantial sections of the paper and contributed to interpretations and conclusions.

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Table 1**Percentage of Prenatal Care Providers who fulfilled each skill item and average scores¹**

#	ITEM	Nurses / midwives (285)
1.	Washes hands with soap & water and dries them	13.0 (284)
2.	Greets and calls woman by her first name and introduces him/herself if first visit	91.6
3.	Ensures woman is in a comfortable environment	51.2
4.	Explains purpose of the session and nature of the procedures	53.5 (284)
5.	Asks questions and allows client to express herself	88.4 (284)
6.	Pays attention and is interested in personal problems of the woman	68.1
7.	Reviews clinic record before start of session/does new record for new client	63.9
8.	In case it's possible, performs medical tests (urine, blood)	53.4 (279)
9.	Explores pulse rate	20.8 (283)
10.	Explores blood pressure	91.9
11.	Takes temperature	13.0 (284)
12.	Gets anthropometric measurements: weight, height	48.2 (284)
13.	Examines skin and <i>conjunctivae</i>	16.1
14.	Checks for oedema, redness and varicose veins – legs	44.9
15.	Examines thyroid, mouth	4.2
16.	Examines breasts	31.0 (284)
17.	Examines the heart and lungs, if necessary send her to the relevant specialist	13.7
18.	Inspects and palpates abdomen for scars, pigmentation...	11.6
19.	Palpates uterus and performs maneuvers to detect fetal position and situation	29.5 (281)
20.	Measures uterine height, abdomen circumference and listens to the fetal heart rate (in case of pregnancy \geq 18 weeks)	37.7 (281)
21.	Determines weeks of pregnancy and probable delivery date	38.9
22.	Informs woman about the progress of pregnancy	29.8
23.	Informs woman about her health condition	30.5
24.	Informs woman about the fetus' health condition	16.5
25.	Informs woman about any complications	29.8
26.	Orients woman on the place of delivery (hospital contacts, transportation, etc.)	46.3
27.	Orients woman about management of common pregnancy-related afflictions	33.7
28.	Orients woman about personal hygiene, rest and general care	69.1
29.	Orients woman about gender, sexuality and STI prevention	15.1
30.	Orients woman about alarm signs: pain, fever, bleeding and loss of vaginal fluid	34.4
31.	Counsels woman about her nutritional needs and prescribes iron and folates	16.8
32.	Informs woman of positive and side effects of medicines during pregnancy	6.3
33.	Orients woman about breast feeding, baby vaccination and use of contraception	37.3 (284)
34.	Solicits questions to ensure client has understood	26.3
35.	Schedules appointment according to clinic needs and woman's convenience	54.4
36.	Records all findings, assessments, diagnosis and care with client	38.9
37.	Thanks client for her time	50.5
AVERAGE PERCENTAGE SCORE		38.4%
TOTAL SKILLS SCORE (Items 0 – 37)²		14.2

¹ Percentages of total valid observations² Obtained by adding up all the positive answers to each item: range 0 – 37 (0 = Nil; 37 = All)

* p<0.05; ** p<0.01; NS: not significant

Table 2

Percentage of Postpartum Care Providers Who Fulfilled Each Skill Item and Average Scores¹

#	ITEM	Nurses / midwives (285)
1.	Washes hands with soap & water and dries them	22.8
2.	Greets and calls woman by her first name and introduces him/herself if first visit	91.9
3.	Ensures woman is in a comfortable environment	38.0 (284)
4.	Explains purpose of the session and nature of the procedures	52.5 (284)
5.	Asks questions and allows client to express herself	85.6 (284)
6.	Pays attention and is interested in personal problems of the woman	69.5
7.	Asks about last pregnancy and delivery: evolution, outcome, any complications	71.9
8.	Asks about present status and any danger signs	73.7
9.	Explores pulse rate	20.9 (282)
10.	Explores blood pressure	66.3
11.	Takes temperature	58.1 (284)
12.	Examines skin and <i>conjunctivae</i>	18.7 (284)
13.	Checks for oedema, redness and varicose veins – legs	16.2 (284)
14.	Inspects and palpates abdomen for uterine involution	41.8
15.	Examines breasts and inquires for any lactation problem	74.7
16.	Examines lochia (amount, color, smell)	48.4
17.	Asks about baby's health: sleeping, feeding, posture, skin color, breathing, fever	68.1
18.	Assesses baby's health: feeding, posture, skin color, breathing, fever	57.5
19.	Informs woman about her health condition	44.9
20.	Informs woman about the baby's health condition	49.8
21.	Informs woman about potential complications and trains on self assessment	40.0
22.	Orients woman about breast feeding and breast care	86.3
23.	Orients woman about personal hygiene	74.0
24.	Orients woman about gender, sexuality and STI prevention	24.2
25.	Counsels woman about her nutritional needs	60.4 (283)
26.	Orients woman about hospital/clinic services (e.g. location, hours, etc.) for follow-up	32.4 (284)
27.	Orients woman about baby vaccination	56.1
28.	Orients woman about birth spacing and contraception	19.4 (284)
29.	Solicits questions to ensure client has understood	31.6
30.	Schedules appointment according to clinic needs and woman's convenience	60.4
31.	Records all findings, assessments, diagnosis and care with client	39.3
32.	Thanks client for her time	46.3
AVERAGE PERCENTAGE SCORE		51.3%
TOTAL SKILLS SCORE (Items 0 – 32)²		16.4

¹ Percentages of total valid observations

² Obtained by adding up all the positive answers to each item: range 0 – 32 (0 = Nil; 32 = All)

Table 3
Mean Prenatal and Postpartum Care Scores
by Presence/Absence of Performance Factors*

FACTOR	RESPONSE (%)	PNC MEAN SCORE	N	PPC MEAN SCORE
BACKGROUND				
1. Facility type	Polyclinic/Women's consultation	17.4**	64	18.0
	Ambulatory/Health Center	13.4	68	15.7
	FAP	13.2	153	16.2
2. Worker category	Nurse	13.5*	170	16.9
	Midwife – Nurse/midwife	15.4	108	16.0
3. Age	≤ 41 yrs.	13.9	140	16.1
	42+	14.4	145	16.8
4. Years working in the facility	0-11	14.1	138	16.4
	12+	14.3	147	16.5
JOB EXPECTATIONS				
5. Has job description	Yes	15.7*	76	18.8**
	No, DK	13.6	209	15.6
6. Whether standards for performance have been set	Yes	14.4	223	16.8
	No	13.4	62	15.3
MOTIVATION & INCENTIVES				
7. Receive bonuses or raises for good work	Yes	14.0	23	16.0
	No	14.2	262	16.5
8. Non-monetary incentives (employer) – 1 st reply	Yes	14.4**	272	16.7**
	No	8.6	13	10.7
9. Non-monetary incentives (community) – 1 st reply	Yes	14.3*	280	16.6**
	No	7.6	5	7.4
10. Opportunities for promotion	Yes	15.8	48	17.7
	No	13.8	220	16.2
11. Disincentives for job badly done	Yes	14.2	112	16.3
	No	14.8	127	15.9
FEEDBACK				
12. Receive feedback about job performance	Yes	14.3	265	16.4
	No	12.7	15	16.3
13. Appropriate Feedback (composite)	Yes	14.6 [†]	217	16.9 [#]
	No, DK	12.8	68	15.1
14. Having Performance Reviews	Yes	14.8*	183	17.4**
	No, DK	13.1	102	14.8
ORGANIZATIONAL SUPPORT				
15. Received supervision in last 6 months	Yes	14.4*	267	16.6
	No	10.9	18	14.2
16. Nature of supervision – 1 st reply	Admin	14.8	213	16.8
	Other	11.8	35	16.1
WORK ORGANIZATION & ENVIRONMENT				
17. Adequacy of Jobplace (composite)	Yes (≥75%)	14.3	184	16.5
	No (<75%)	13.9	101	16.4
18. Has the necessary equipment, instruments and supplies	Yes	15.5**	117	17.0
	No	13.3	166	16.1

FACTOR	RESPONSE (%)	PNC MEAN SCORE	N	PPC MEAN SCORE
19. Satisfied w/organization of work	Yes	14.9**	218	16.9*
	No, DK	11.8	67	14.9
KNOWLEDGE & SKILLS				
20. Believes has necessary skills to do the job	Yes	14.8**	234	17.0**
	No, DK	11.5	51	13.9
21. Whether received training in RH	Yes	15.0*	171	17.1*
	No	13.0	114	15.4
22. Been trained in the use of tools	Yes	15.0**	211	17.5**
	No	11.8	72	13.3
23. Year of last training	2001-2002	15.3	128	17.7
	1972-1999	13.9	43	17.0
OVERALL MEAN SCORE		14.2	285	16.4

* p<0.05; ** p<0.01; + p=0.047; # p=0.05

*variables significant for both clinical areas are highlighted

Table 4**Features of the Best-Fit Multiple Regression Model
of Performance (Prenatal Care) and Factors**

Variables in the model	Unstandardized Coefficients - B	Std Error	Standardized Coefficients - Beta	t	Sig.
(Constant)	5.631	1.958	--	2.875	.004
Incentives by employer	4.687	1.880	.144	2.493	.013
Have you been trained in using the tools	2.317	.910	.149	2.547	.011
Facility type	-1.659	.479	-.200	-3.466	.001

Dependent Variable: Provider Performance Score
R=0.319; R Square=0.102; R Square Adjusted=0.092

Table 5**Features of the Best-Fit Multiple Regression Model
of Performance (Postpartum Care) and Factors**

Variables in the model	Unstandardized Coefficients - B	Std. Error	Standardized Coefficients - Beta	t	Sig.
(Constant)	2.861	3.010	---	.951	.343
Incentives bycommunity	8.195	2.893	.160	2.833	.005
Have you been trained in using the tools	3.370	.911	.219	3.699	.000
Do you think you have the necessary skills for doing your present job?	2.113	1.034	.121	2.043	.042
Are there any performance reviews?	2.030	.791	.145	2.566	.011

Dependent Variable: Provider Performance Score
R=0.370; R Square=0.137; R Square Adjusted=0.125

Table 6

**Predictors of Performance in PNC
and PPC skills areas and Order of Importance**

Predictors	PNC	PPC
Background		
Type of facility in which provider works	1 st	
Performance Factors		
Motivation & Incentives		
Incentives by employer	3 rd	
Incentives by community		2 nd
Knowledge & Skills		
Having been trained in the use of clinic tools	2 nd	1 st
Job Expectations		
Having a written job description		3 rd
Feedback (& Org. Support)		
Having had performance reviews		4 th
R Square (adjusted)	0.09	0.13

Additional Files

Additional File 1- The Performance Factors and Actual Performance- How do they relate?

Additional files provided with this submission:

Additional file 1: ArmeniaPFSSPaper6-Graph.doc : 23KB

<http://www.human-resources-health.com/imedia/1366922403224156/sup1.doc>