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ABSTRACT

Family planning time survivial rates have been applied extensively to evaluate the effectiveness of various methods or programs. Visit continuation rates have received less attention. In this paper it will be argued that visit continuation rates are of great usefulness to the family planning administrator. Relevant dimensions along which to segment the family planning population with regard to visit continuation rates are investigated. After studying the distribution of inter visit times, various management decision areas are discussed where visit continuation rates can help the family planning administrator. The areas considered are forecasting and planning, evaluation of program changes and program effectiveness, allocation of follow up effort, and finally, policy decisions.

INTRODUCTION

In family planning programs, time continuation (or survival) rates of the patients are used widely for evaluating the effectiveness of various contraceptive methods and for program evaluation. However, in our opinion, for the program administrator time survival rates convey much less information for his day to day decision making than do visit survival rates. For example, one of the tasks of the administrator is to forecast future patient load, the methods which patients are likely to select and the frequency of their visits, so that he can plan the number of clinic sessions for a given period of time, the quantity of various contraceptive supplies, and how much personnel will be needed. Time continuation rates would tell him, for example, that of 100 pill patients 50 will be continuing after one year. This knowledge does not help the family planning administrator very much in forecasting and planning. He needs to predict how many visits will be made during that year. Although only 50 patients are continuing after a year, more than 50 will have made visits. So we need to know how many patients will make one visit during that year and when, how many will make a second visit and so on. These data can be obtained by studying visit continuation rates.

After a brief discussion of the data base, visit continuation rates as used in this paper are defined. It will be shown that the following are some of the relevant dimensions along which visit continuation rates can be segmented: method of contraception, the number of visits

the patient has already made, agency providing the service, race, parity level (defined for this study, as the number of children alive), women new to the system versus women who become pregnant while in the system.

Visit continuation rates need to be associated with the time between consecutive visits in order to become useful for the family planning administrator. In general we found that patients came back earlier than they were asked to, thus increasing the demand on services at the clinics. Distributions of inter visit times for IUD and pill will be presented.

Managerial implications of visit continuation rates in four areas are discussed. One is forecasting and planning as mentioned above. The other areas are evaluation of program changes and program effectiveness, allocation of follow-up effort and finally, implications for policy decisions.

The Metropolitan Atlanta Family Planning System

The data used in this paper come from the Metropolitan Atlanta Family Planning System. The Atlanta System consists of three major agencies providing Family Planning services to the indigent population in the metropolitan Atlanta region. These agencies are, the Grady Hospital, the Planned Parenthood Association of Atlanta, and the County Clinics. These agencies are coordinated by an office attached to the Metropolitan Atlanta Council for Health. In addition to various other services, the Coordinating Office provides these agencies with a computer-based data service system, which has been developed and is being operated by the Center for Disease Control.

The Grady Hospital accounts for nearly sixty percent of the active patients. Most of the indigent deliveries in the area take place at the Grady Hospital. Slightly over half the women delivering at Grady are contacted by family planning personnel before they are discharged from the hospital. Such people are classified in this paper as "seen immediately." Those women who are not seen before they leave the hospital are contacted when they make their six weeks post partum examination visit, and are classified as "not seen immediately." In addition to the post partum program, Grady Hospital also operates a non post partum clinic.

The analysis is based on records of 67,723 visits made by 23,052 patients between January 1, 1967 and October 31, 1970.

Visit Continuation Rates Defined

Consider all the patients in a family planning system who made visit number i. Of these patients some make visit number i+1, either chosing the same method as before (NEXT) or a different method (SWITCHED). There could be three reasons for patients not making visit number i+1. For some the date of their next appointment is after the data cutoff date, in our case October 31, 1970 (PROSPECTS). Some others have missed their appointment date (INACTIVES). Some patients who made visit number i come back into the system after a pregnancy termination. These patients are not considered to have made visit number i+1, but instead are restarted from visit number 1(PREGNANT). These categories are diagrammatically shown below.

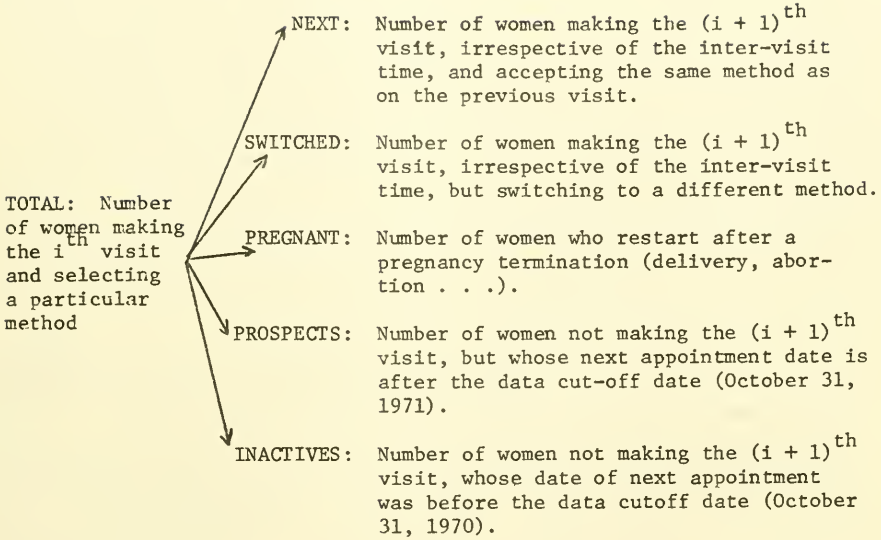


DIAGRAM 1:

Patient Categories between Visits

The visit continuation rate from visit i to visit i + 1 is defined here as: [1]

$$\frac{\text{NEXT + SWITCHED}}{\text{TOTAL - PROSPECTS}} \times 100$$

Method specific and agency specific visit continuation rates have been determined for visits one through six for white and non-white patients. In each patient classification results are presented for four parity levels. Table 1 shows visit continuation rates for non-white pill patients, Table 2 for white pill patients and Table 3 for non-white IUD patients.[2] The column headings are to be interpreted as follows: Total number of women stands for the total number of women who make a first visit. Visit continuation rate 1-2 means the percentage of women making the first visit who will return for the second visit.

Discussion of Visit Continuation Rates Tables

In this section we discuss the major conclusions that can be drawn from the data analysis. We have generally avoided attaching levels of statistical significance to our results because most of the inferences made are based on such a large number of observations that in a statistical sense high levels of significance will easily be achieved. In any event when the word "significant" is used, it will stand for "statistically significant at the 0.01 level or better," and similarly for the phrase "not significant."

Differences by Race:

Visit continuation rates were generally higher for non-white patients than for white patients in all agencies, for all parity levels, for any visit and for both IUD and pill.[3] Although true for all agencies,

TABLE 1:
Visit continuation rates for non-white pill patients

CLASSIFICATION	Total Number of Women	VISIT CONTINUATION RATES (%) *				
		1-2	2-3	3-4	4-5	5-6
PARITY = 0						
GRADY HOSPITAL						
Post Partum						
Seen immediately	272	65	54	76	85	
Not seen immediately	283	34	60	76		
Non Post Partum	419	43	67	61		
PLANNED PARENTHOOD	666	65	73	76	76	85
COUNTY CLINICS	62	69				
PARITY = 1						
GRADY HOSPITAL						
Post Partum						
Seen immediately	1897	79	64	80	83	87
Not seen immediately	2942	55	79	84	86	88
Non Post Partum	354	48	64	84	86	88
PLANNED PARENTHOOD	322	71	83	89	85	96
COUNTY CLINICS	80	78	84			
PARITY = 2						
GRADY HOSPITAL						
Post Partum						
Seen immediately	1139	75	71	84	90	87
Not seen immediately	1232	59	81	88	88	92
Non Post Partum	245	58	77	81	90	83
PLANNED PARENTHOOD	203	72	84	92	83	94
COUNTY CLINICS	46	73				
PARITY = 3 or more						
GRADY HOSPITAL						
Post Partum						
Seen immediatley	1446	67	71	88	87	85
Not seen immediately	1339	58	81	87	90	88
Non Post Partum	386	58	80	91	84	93
PLANNED PARENTHOOD	247	79	86	85	95	90
COUNTY CLINICS	73	78	86			

* All percentages shown are based on a denominator (i.e., total minus prospects) of at least 25 women.

TABLE 2:
Visit continuation rates for white pill patients

CLASSIFICATION	Total Number of Women	VISIT CONTINUATION RATES (%) *				
		1-2	2-3	3-4	4-5	5-6
PARITY = 0						
GRADY HOSPITAL						
Post Partum						
Seen immediately	70	46				
Not seen immediately	37	27				
Non Post Partum	268	56	47			
PLANNED PARENTHOOD	510	54	60	79	79	
COUNTY CLINICS	31	71				
PARITY = 1						
GRADY HOSPITAL						
Post Partum						
Seen immediately	281	57	51	67		
Not seen immediately	302	35	71	72		
Non Post Partum	95	38				
PLANNED PARENTHOOD	182	72	78	93	88	
COUNTY CLINICS	51	73				
PARITY = 2						
GRADY HOSPITAL						
Post Partum						
Seen immediately	265	59	59	76		
Not seen immediately	162	46	60	72		
Non Post Partum	48	41				
PLANNED PARENTHOOD	147	65	78	89	78	
COUNTY CLINICS	53	80				
PARITY = 3 or more						
GRADY HOSPITAL						
Post Partum						
Seen immediately	283	47	51	67		
Not seen immedaitely	188	51	65	86		
Non Post Partum	79	45				
PLANNED PARENTHOOD	188	74	82	84	89	82
COUNTY CLINICS	53	81	87			

* All percentages shown are based on a denominator (i.e., total minus prospects) of at least 25 women.

TABLE 3:
Visit continuation rates for non-white IUD patients

CLASSIFICATION	Total Number of Women	VISIT CONTINUATION RATES (%) *				
		1-2	2-3	3-4	4-5	5-6
PARITY = 0						
GRADY HOSPITAL						
Post Partum						
Seen immediately	85	74	50			
Not seen immediately	89	65	72			
Non Post partum	93	62				
PLANNED PARENTHOOD						
COUNTY CLINICS						
PARITY = 1						
GRADY HOSPITAL						
Post Partum						
Seen immediately	734	69	72	83	84	
Not seen immediately	1315	69	75	74	83	80
Non Post Partum	185	59	81	68		
PLANNED PARENTHOOD	60	66				
COUNTY CLINICS						
PARITY = 2						
GRADY HOSPITAL						
Post Partum						
Seen immediately	503	75	66	72		
Not seen immediately	707	67	77	75	75	72
Non post partum	163	68	71	76		
PLANNED PARENTHOOD	46	68				
COUNTY CLINICS						
PARITY = 3 or more						
GRADY HOSPITAL						
Post Partum						
Seen immediately	783	69	60	70	81	
Not seen immediately	925	63	67	76	71	84
Non Post Partum	278	65	69	82		
PLANNED PARENTHOOD	73	56				
COUNTY CLINICS	33	87				

* All percentages shown are based on a denominator (i.e., total minus prospects) of at least 25 women.

the difference is larger at Grady Hospital than at either Planned Parenthood or the County Clinics. The public family planning system is geared to the indigent population, the majority of whom in Atlanta are non-whites. It is worth investigating why the system is unable to retain the same percentage of whites as non-whites. One possible explanation is that white patients are more likely to look for private protection after the first few visits in the system. Some preliminary information consistent with that hypothesis is available when percentage of pregnancies rather than visit continuation rates are compared. We will come back to this point below. The hypothesis, however, cannot be confirmed wihtout making a survey.

Number of Visits Made Already:

The continuation rates generally improve as a person ages in the system. That is, continuation rates between visits two and three are higher than continuation rates between visits one and two. Similarly, continuation rates between visits three and four are higher than between visits two and three. As a patient continues to make further visits, however, the continuation rates tend to level off and become nearly constant. The largest improvement occurs from continuation rates 1-2 to continuation rates 2-3. One notable exception is the Grady-Post-Partum-Seen-Immediately category whose continuation rate 2-3 is lower than 1-2, and more so for lower parity levels. This is an important exception in that the visit continuation rate 1-2 is both a reflection of the six weeks post partum examination return rate and of the visit return rate for the family planning clinic. For higher parity levels

fewer patients not interested in family planning will return just for their six weeks post partum examination, and a higher percentage of the continuation rates between visits one and two will be accounted for by those patients who make their second visit with the express purpose of obtaining family planning service.[4]

So far we looked at the effect of age in the system in terms of subsequent visits. However, another kind of aging can be considered. Take a number of patients who enter the family planning system after a pregnancy termination (delivery, abortion, . . .), and who are of same parity, race, method and agency. Some of these women were in the system before their last pregnancy and will be called "ever in the system" patients. Others join the family planning system for the first time and are called "never in the system." Table 4 illustrates that "ever in the system" patients show significantly higher visit continuation rates 1-2 than "never in the system" patients. For the next two visits the "ever in the system" patients remain better continuers but the difference becomes less substantial. Differences observed for continuation rates 4-5 and 5-6 are not statistically significant.

Visit Continuation Rates and Parity:

Are parity and visit continuation rates related? First, comparing IUD visit continuation rates by parity does not reveal discernible differences. In the few instances where large differences are observed they are not statistically significant. For example, visit continuation rate 2-3 at Grady Hospital Seen Immediately, is 50 per cent for parity 0 and 72 per cent for parity 1. The difference is not significant at the 0.01 level (although it is at the 0.05 level). For pill

TABLE 4:

Visit continuation rates for "never in the system" and "ever in the system" non-white pill patients at the Grady Hospital Post Partum Clinic

CLASSIFICATION	Total Number of Women	VISIT CONTINUATION RATES (%)				
		1-2	2-3	3-4	4-5	5-6
PARITY = 2						
Seen immediately: Never	682	70	66	82	88	89
Ever	457	81	79	87	92	84
Not seen immediately: Never	967	56	80	88	90	91
Ever	265	70	85	88	82	97
PARITY = 3 or more						
Seen immediately: Never	1011	64	70	87	90	86
Ever	435	73	74	92	81	76
Not seen immediately: Never	1094	55	81	86	91	88
Ever	245	74	82	89	90	90

patients, on the contrary, a clear trend is observed. Visit continuation rates are higher for higher parity levels. This finding is contradictory to that reported by Kachirayan (5, P. 17). He found that the percentage of inactive patients among women having two or less children is less than among the women having three or more living children. Frank and Tietze found no discernible differences in continuation rates by parity [3]. The difference in findings could to a certain degree result from the fact that we use visit continuation rates whereas Kachirayan, and Frank and Tietze use time continuation rates. However, later in the paper we will argue that intervisit time tends to become longer as parity increases. Therefore, translating our results in a time continuation rates would make differences between parity levels even greater. A more plausible reason why our findings are at odds with these other studies is that our segmentation is more detailed, that is, we control for method, race, agency and visit number. Furthermore, Kachirayan considers only two parity levels, whereas we have four. The largest increase in visit continuation rates occurs in going from parity 0 to 1. The increase becomes smaller between parity 1 and 2. Differences between parity 2 and 3 or more are very small, with a few exceptions, which are however not statistically significant. Similar patterns are observed for different visits as is illustrated in Figures 1, 2 and 3, for continuation rates 1-2, 2-3, and 3-4 respectively. Figure 1 does not show the visit continuation rates for the Grady Hospital Seen Immediately patients. Looking back at Table 1 we observe that the continuation rates 1-2 for Grady Hospital Seen Immediately do not conform to the pattern we described. This could come about as a result of compounding

Figure 1:
Visit continuation rates 1-2 for non-white pill patients

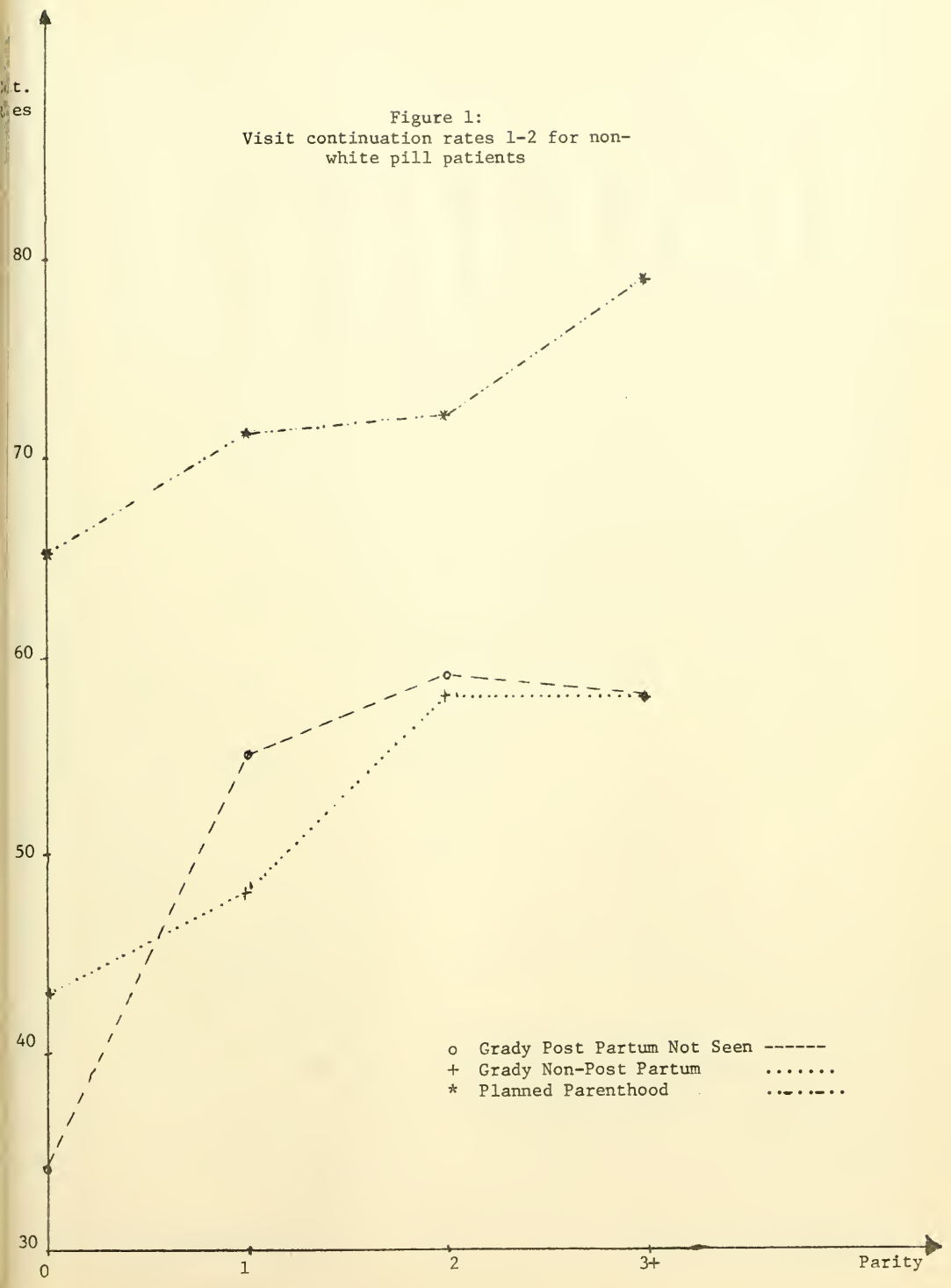


Figure 2:
Visit continuation rates 2-3 for non-white pill patients

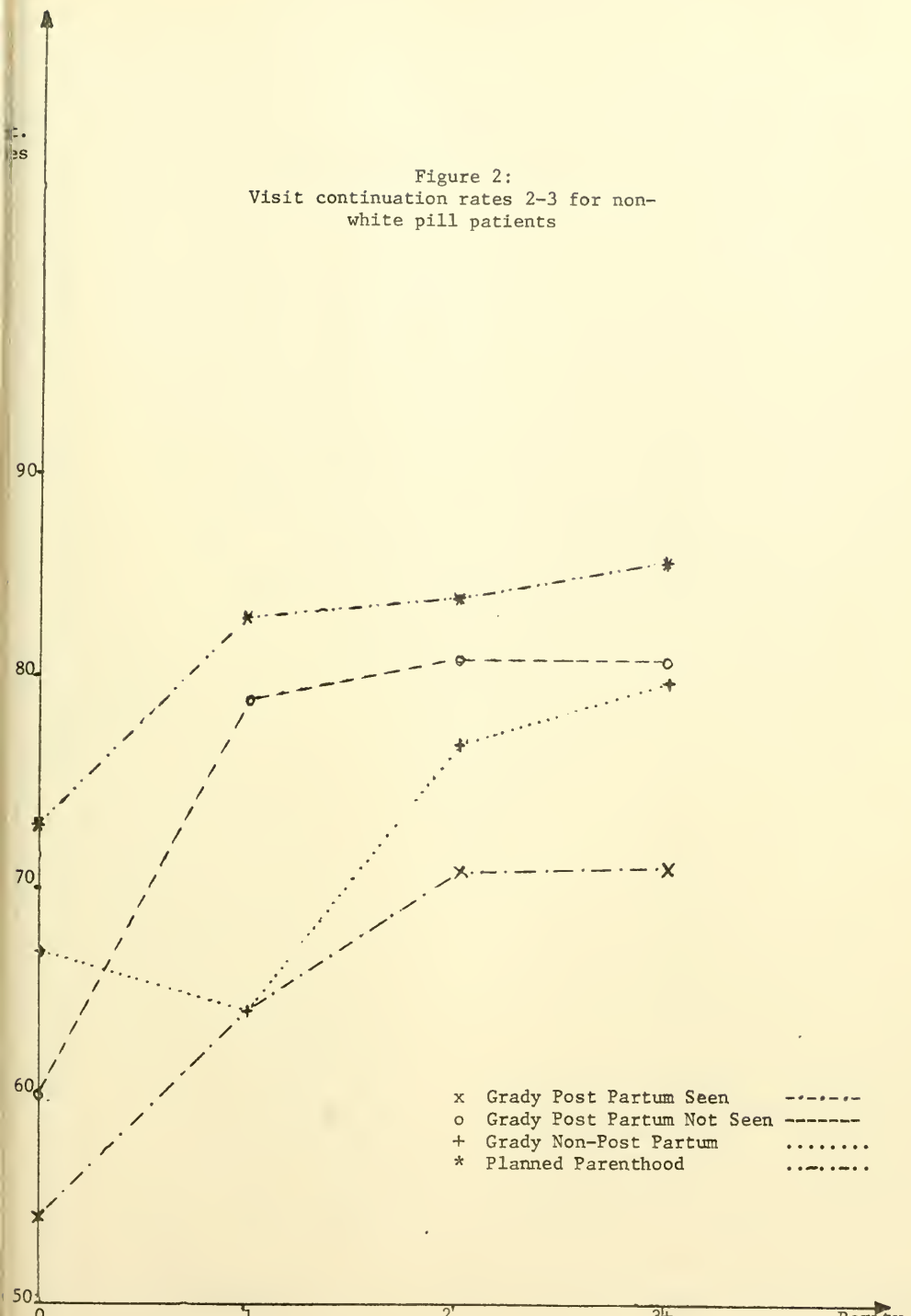
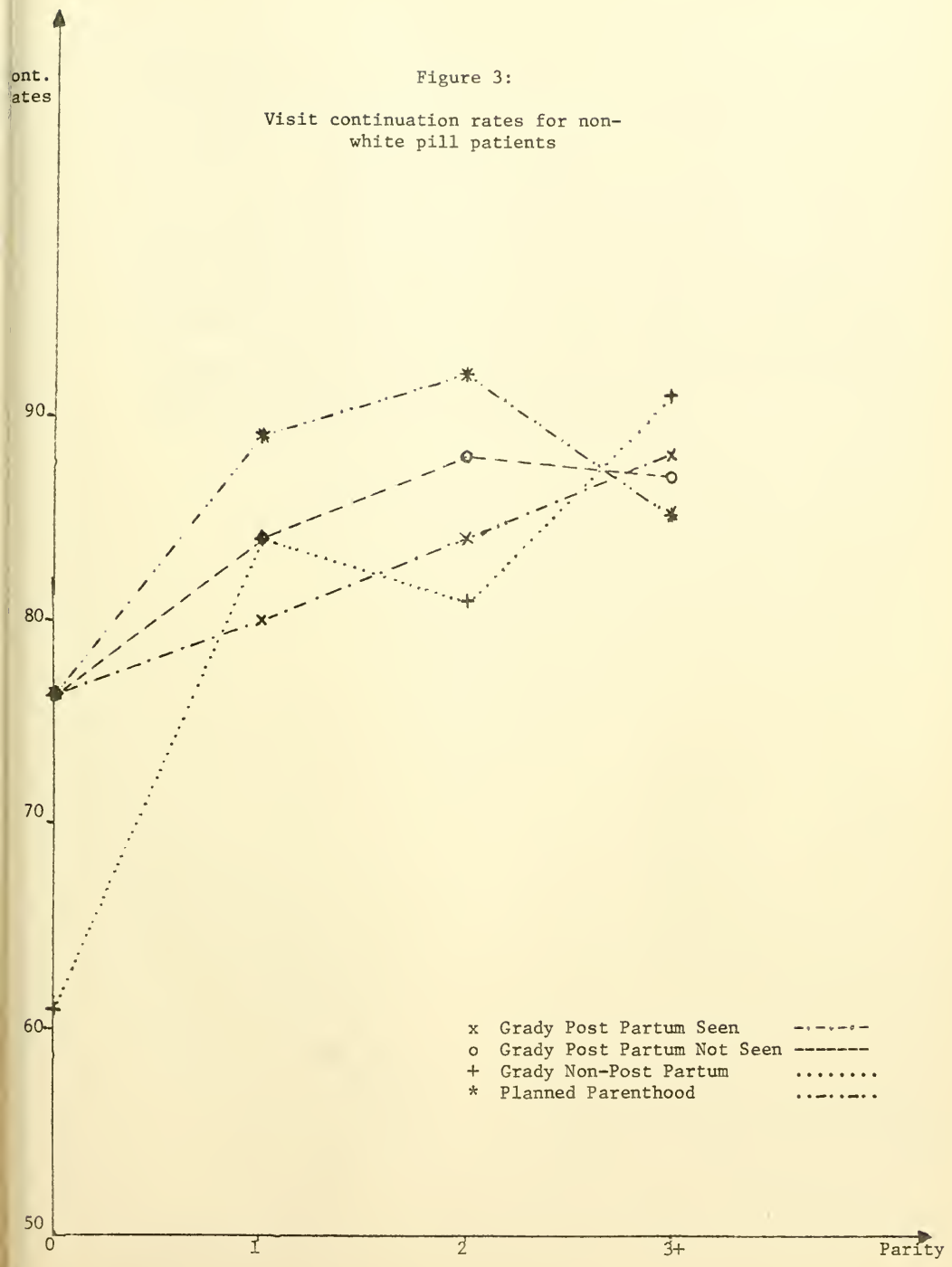


Figure 3:

Visit continuation rates for non-white pill patients



family planning visit continuation rates which increase with parity and pure six weeks post partum return rates which, as was stated before, are likely to decrease as parity increases.[5]

A classification by age groups produced similar patterns of visit continuation as the classification by parity. This is to be expected since age and parity are correlated. To find out whether age and parity have distinct visit continuation patterns, a cross classification of age and parity is required, but because of insufficient funds we did not make such a cross classification.

Differences by Method:

Comparing visit continuation rates for different contraceptive methods does not permit direct evaluation of method continuation over a given period of time, the reason being that inter visit time differs according to method. For example, IUD patients are usually given one year appointments, whereas pill patients are usually given three or six months worth of supplies (depending on the agency policy)[6]. Nevertheless separating visit continuation rates by method is of great importance to the family planning administrator in forecasting and planning clinic visits, family planning materials and personnel. First, consider visit continuation rates 1-2. At Grady Hospital the percentage continuing is considerably larger for IUD than for pill patients. The difference tapers off as parity increases. On the contrary, at Planned Parenthood IUD visit continuation rates are lower than pill visit continuation rates. This could be due to the fact that the ratio of IUD patients to pill patients is much smaller at Planned Parenthood than at Grady Hospital, and to the fact that Planned Parenthood may be less geared to providing IUD service. For subsequent visits, IUD continuation rates increase less rapidly and level off at a rate below that of pill continuation rates. Although in this paper we concentrate on pill and IUD, we may note in passing that visit continuation rates for patients who receove injections are extremely high, even for the first return visit (see Table 5).

Agency-wise Differences:

Visit continuation rates vary widely according to the agency

TABLE 5:
Visit continuation rates for parity 1,non-white Grady Hospital post partum not seen immediately patients

METHOD	Total Number of Women	VISIT CONTINUATION RATES (%)				
		1-2	2-3	3-4	4-5	5-6
Pill	2942	55	79	84	86	88
Injection	89	92	92	96	89	92

providing the service. First, let us compare the non post partum programs, i. e. Grady Hospital Non Post Partum, Planned Parenthood and the County Clinics. We use pill visit continuation rates as the basis for comparison. Visit continuation rates 1-2 are significantly higher at Planned Parenthood than at the Grady Hospital Non Post Partum program. Figure 1 illustrates this quite clearly. The difference is not as large for the two subsequent visits (see Figure 2 and 3). Differences observed for later visits are not statistically significant. Continuation rates 1-2 at the County Clinics are significantly higher than at Planned Parenthood [7] (see Figures 4 and 5). Continuation rates for subsequent visits cannot be compared because of insufficient data. Why are visit continuation rates somewhat better at the County Clinics than at Planned Parenthood, and much better at Planned Parenthood than at Grady Hospital? First of all, there may still be heterogeneity in the population served, even after accounting for parity, race, method and visit number. However, there are other factors that could cause the differences. County Clinics have the most personalized approach to providing family planning service, and Grady Hospital the least personalized approach. Waiting time at Grady is longer than at both Planned Parenthood and the County Clinics.

Visit continuation rates for Grady Post Partum Seen Immediately and not seen Immediately patients cannot be directly compared. The Seen Immediately patients return for their second visit after approximately six weeks (the post partum examination time), whereas the second visit for Not Seen Immediately patients is a normal family planning service visit.

Figure 4:
Visit continuation rates 1-2 for
non-white pill patients

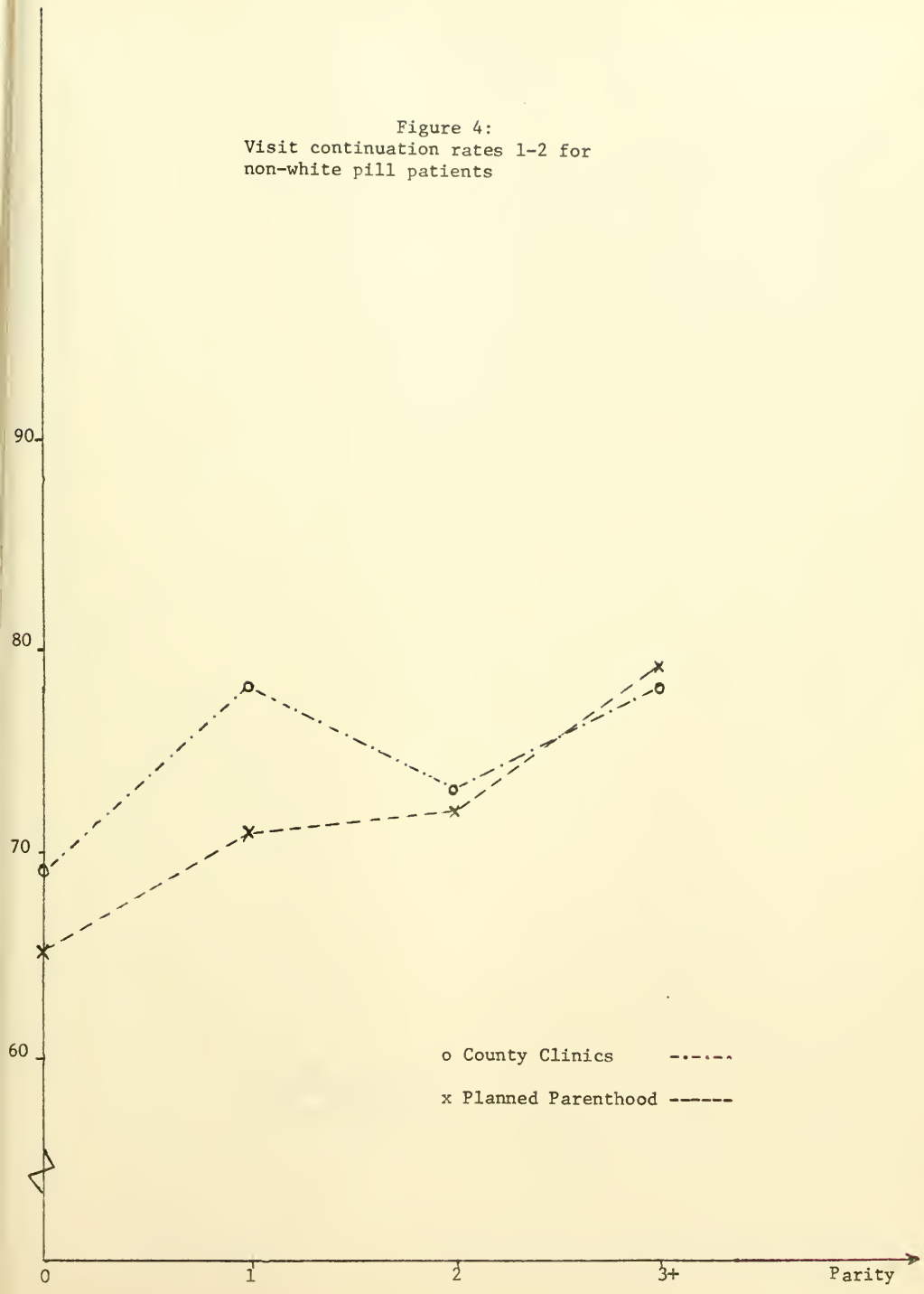
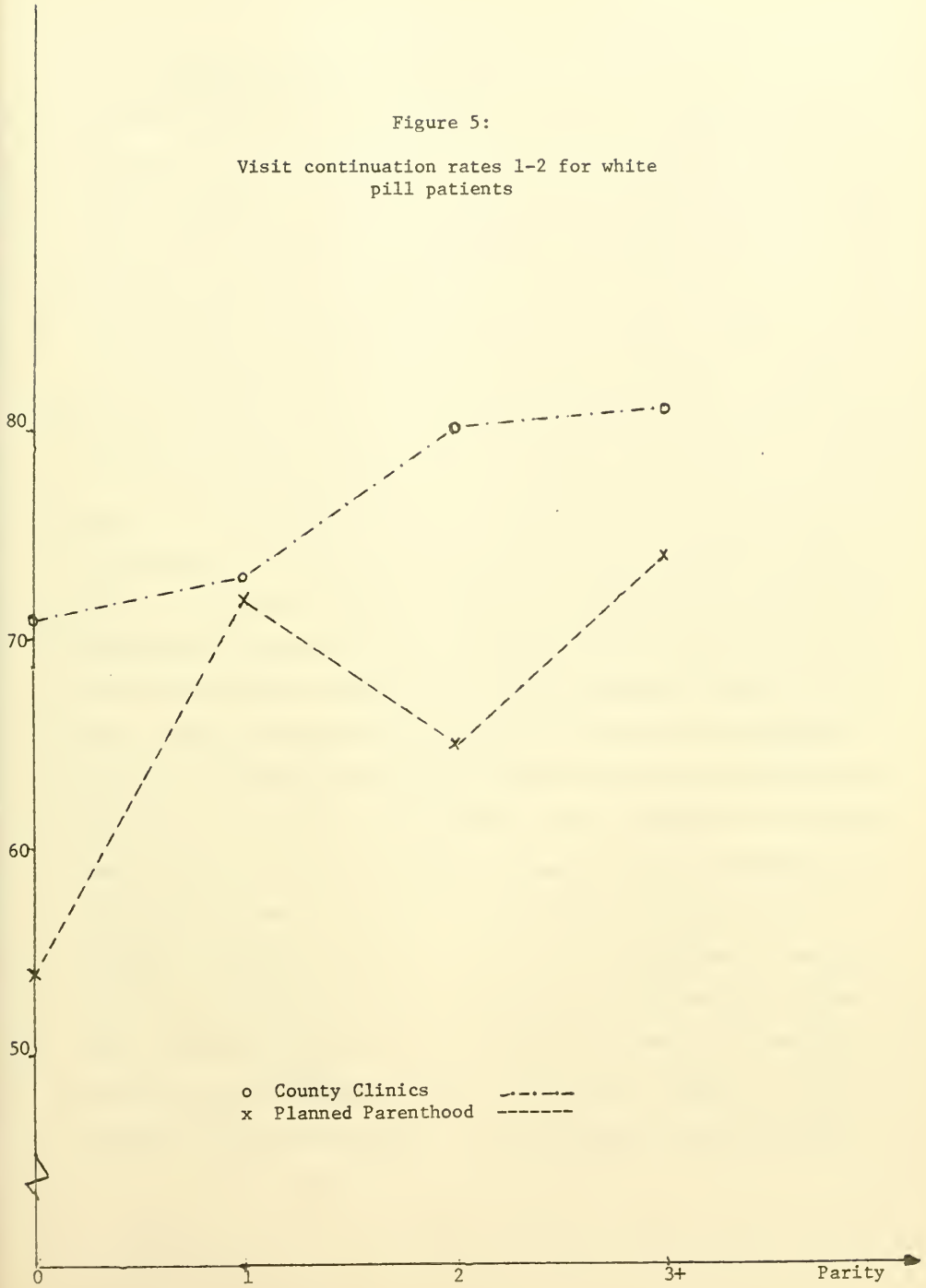


Figure 5:

Visit continuation rates 1-2 for white pill patients



Forecasting Total Patient Visits:

Information regarding time continuation is needed to compare program performance for the two types of Grady Post Partum patients. Visit continuation rates are useful for the family planning administrator in forecasting clinic visits for those patients who have made visits in the system and are expected to continue. On the other hand, new patients will join the system, or patients who dropped out may return. There will be non post partum women who seek protection against pregnancy. The best predictors of how many non post partum women will join are possibly past trends and amount of effort expended in outreach, publicity etc. On the other hand, there will be women who seek protection after a pregnancy termination. Of these, some will join the system for the first time, others may have been in the system before but discontinued. Visit continuation rates themselves are not sufficient to tell us how many of the patients who dropped out will return after a pregnancy termination, and when. Firstly, because inter visit times are different for different methods, and secondly, because some methods keep a woman protected for a longer time after visit discontinuation (such as IUD) than other methods (such as pill). However, going back to Diagram 1 used in defining visit continuation rates, one category is those women who restart after a pregnancy termination. From this we can find the percentage of women who drop out of the system because of pregnancy and also eventually return. Table 6 contains these restart percentages for non-white pill and IUD patients at Grady Hospital who make only one visit. Figures 6, 7 and 8 are based on the data in Table 6. From the figures, non-white patients

TABLE 6:
Percentage of non-white women making only one visit but eventually returning to the system after a Grady pregnancy termination

CLASSIFICATION	PILL			IUD		
	Total Minus Prospects	Per cent Returning	Average Time to Return*	Total Minus Prospects	Per cent Returning	Average Time to Return*
PARITY = 0						
Post Partum seen	239	5.0	-	69	0.0	-
Post Partum not seen	252	21.4	501	78	5.1	-
Non Post Partum	279	10.0	451	63	3.2	-
PARITY = 1						
Post Partum seen	1775	4.5	450	566	3.0	-
Post Partum not seen	2604	19.1	526	1116	5.7	544
Non Post Partum	294	17.0	569	155	4.5	-
PARITY = 2						
Post Partum seen	1056	5.3	477	367	3.0	-
Post Partum not seen	1138	18.0	569	612	5.6	602
Non Post Partum	204	14.7	471	133	3.8	-
PARITY = 3 or more						
Post Partum seen	1377	6.9	496	633	4.3	499
Post Partum not seen	1258	16.8	560	834	5.2	579
Non Post Partum	339	9.4	520	251	2.4	-

* Average time to return is in number of days. It is shown only when the number of women returning is at least 25.

Figure 6:
Percentage of Grady Post Partum Seen Immediately patients making only one visit but eventually returning to the system after a Grady pregnancy termination.

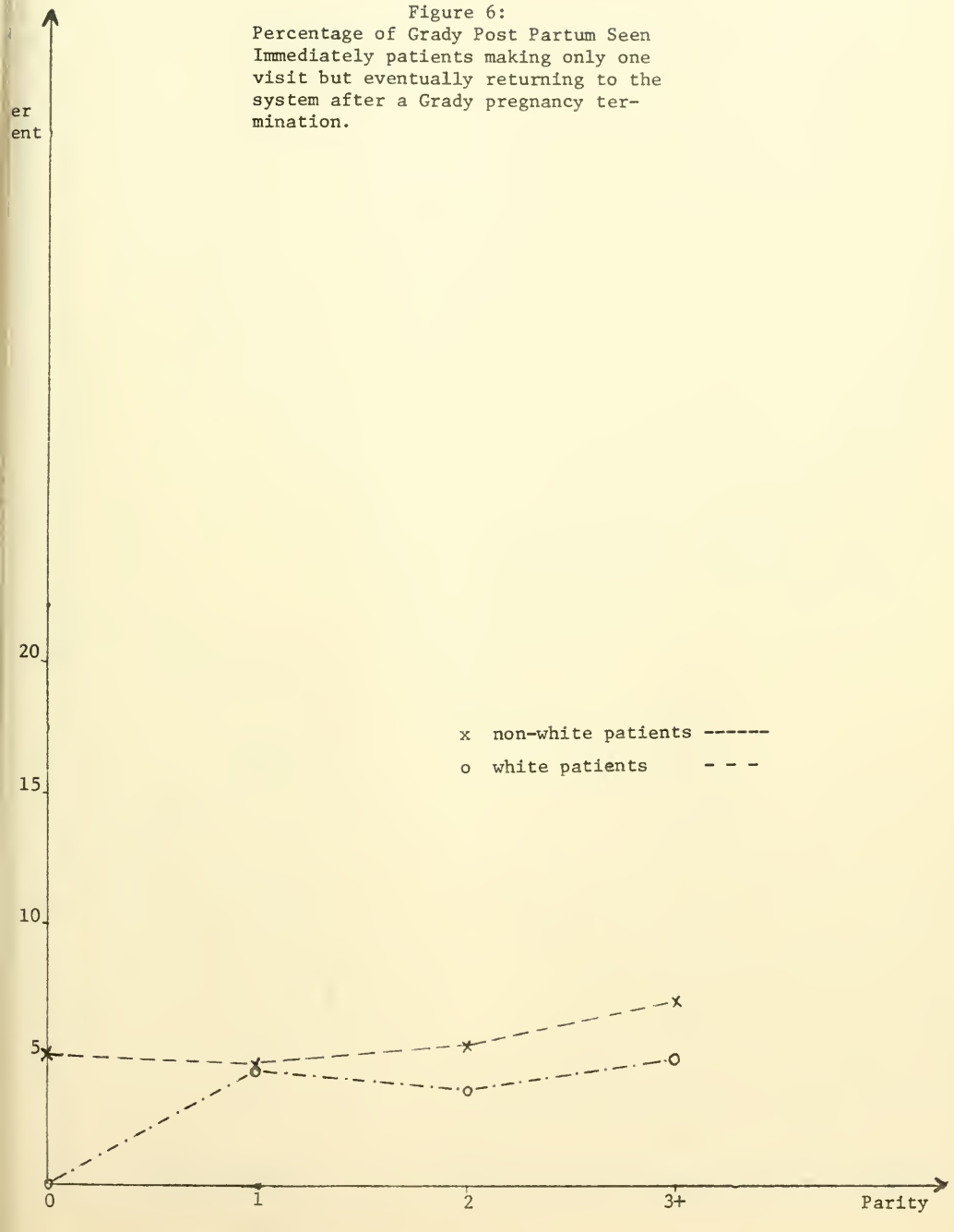


Figure 7:
Percentage of Grady Post Partum Not Seen Immediately patients making only one visit but eventually returning to the system after a Grady pregnancy termination.

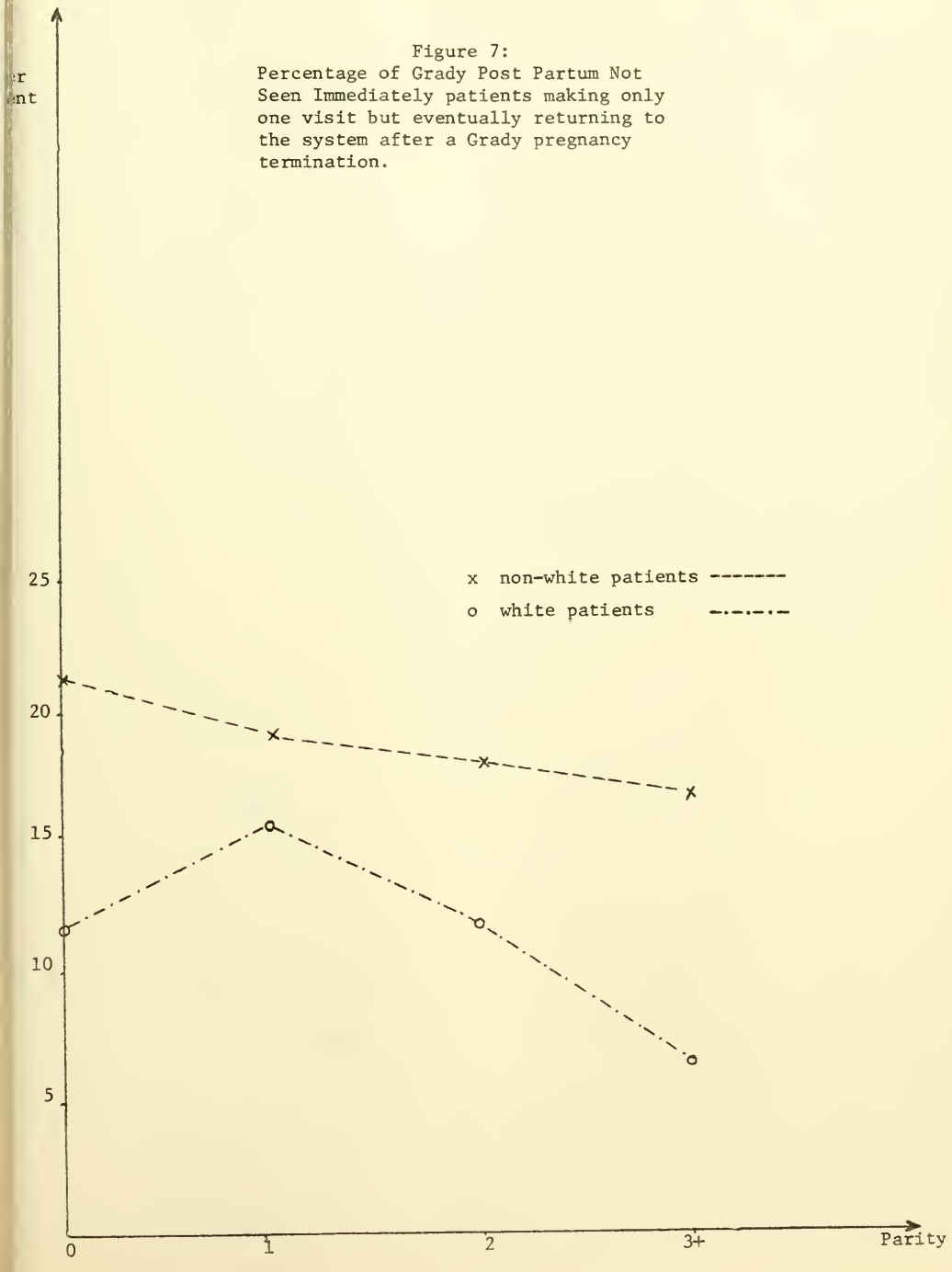
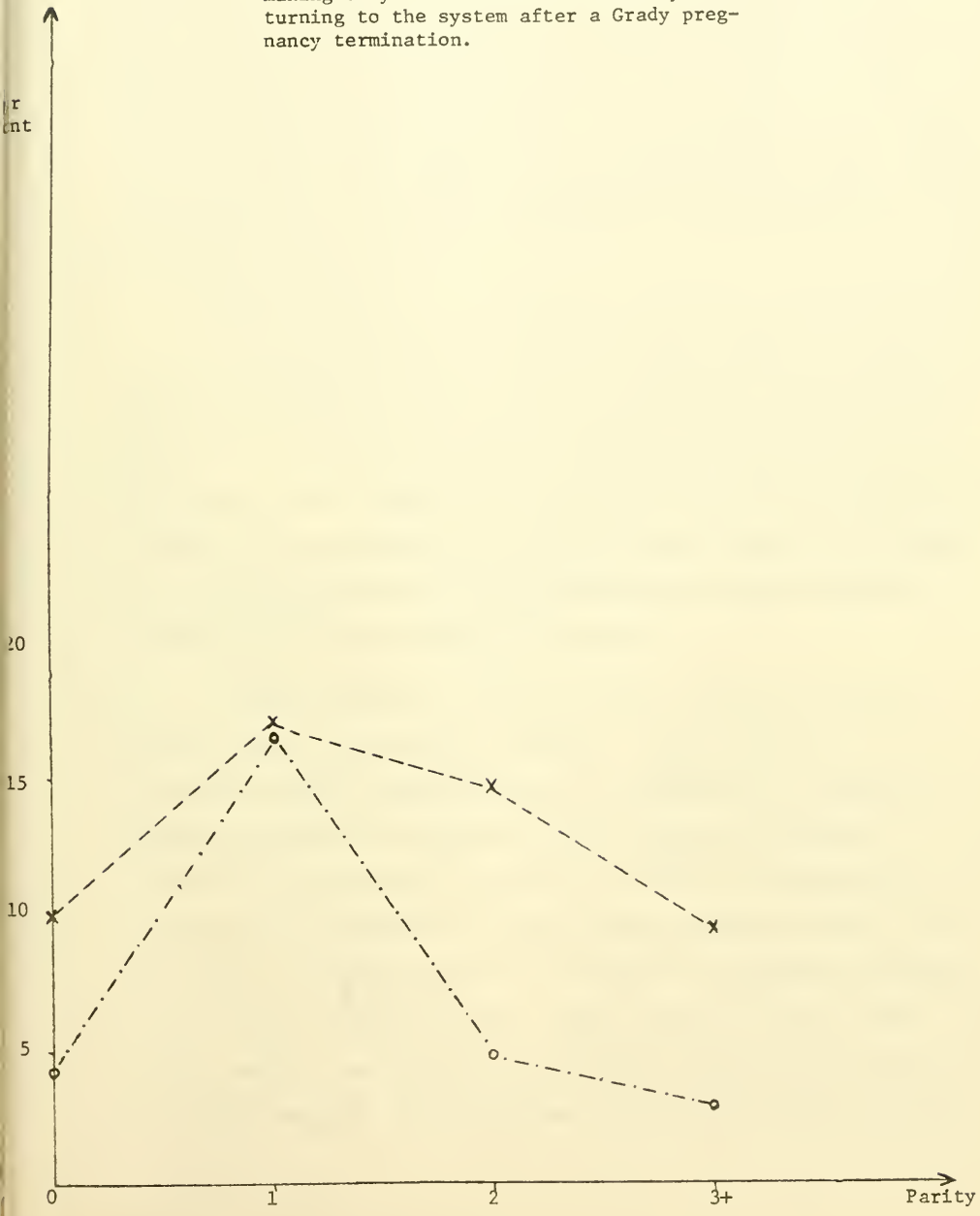


Figure 8:
Percentage of Grady Non-Post Partum Patients making only one visit but eventually returning to the system after a Grady pregnancy termination.



have much higher restart rates than white patients. This seems contradictory to our previous finding that non-white patients have higher visit continuation rates. However, the contradiction lends support to the hypothesis that white patients are more likely to look for other means of protection after a few visits. Comparing Figures 6 and 7 should not be considered evidence that "Seen Immediately"patients have a better continuation record than "Not Seen Immediately" patients because of differences in inter-visit time.

The knowledge of the percentage of women who will eventually return to the system after termination of pregnancy should be supplemented by information on when these women will return. Average times between the visit and the return to the system are given in Table 6. 61% return as "seen immediately" patients and 32% as "not seen immediately" patients. The total number of post partum women entering the system for the first time can again be estimated from historical data, and 57% of these will be "seen immediately" patients.

The percentage of acceptors selecting particular methods is given in Table 7 (for non-white patients). These percentages vary according to agency, perhaps because of differences in the population seeking contraceptive protection at various agencies (although we account for race and parity), but also as a result of differences in agency policies regarding how to provide family planning service.[8] At all agencies, the higher parity is, the higher the percentage of women who select more effective methods. Table 8 shows that "ever in the system" patients tend to choose more effective methods than "never in the system" patients. The percentages of particular methods chosen are

TABLE 7:
Percentage of non-white women choosing particular methods on initial visit

CLASSIFICATION	Total Number of Women	METHOD (%)				
		IUD	Pill	Shot	Surgery	Foam
PARITY = 0						
GRADY HOSPITAL						
Post Partum						
Seen immediately	428	19.8	63.6	4.2	1.2	11.2
Not seen immediately	405	22.0	69.8	2.5	0.8	4.9
Non Post Partum	571	16.3	73.4	6.5	1.2	2.6
PLANNED PARENTHOOD	714	4.2	93.3	0.4	-	2.1
COUNTY CLINICS	84	17.9	73.8	-	-	8.3
PARITY = 1						
GRADY HOSPITAL						
Post Partum						
Seen immediately	3059	24.0	62.0	1.7	0.2	12.1
Not seen immediately	4535	29.0	64.8	2.0	0.2	4.0
Non Post Partum	610	30.4	58.0	5.6	0.3	5.7
PLANNED PARENTHOOD	398	15.1	80.9	0.5	-	3.5
COUNTY CLINICS	113	23.9	70.8	-	-	5.3
PARITY = 2						
GRADY HOSPITAL						
Post Partum						
Seen immediately	2041	24.6	55.8	6.1	1.0	12.5
Not seen immediately	2212	32.0	55.8	6.4	1.6	4.2
Non Post Partum	495	33.9	49.5	11.1	1.7	4.8
PLANNED PARENTHOOD	265	17.3	76.6	0.8	-	5.3
COUNTY CLINICS	69	24.6	64.4	-	-	9.0
PARITY = 3 or more						
GRADY HOSPITAL						
Post Partum						
Seen immediately	3402	23.0	42.5	17.7	5.9	10.9
Not seen immediately	3153	29.4	42.5	12.6	11.2	4.3
Non Post Partum	863	32.2	44.7	13.2	5.2	4.7
PLANNED PARENTHOOD	341	21.4	72.5	0.5	-	5.6
COUNTY CLINICS	120	27.5	60.8	-	-	11.7

TABLE 8:
Percentage of Grady Hospital "not seen immediately" patients choosing particular methods on initial visit.

CLASSIFICATION	Total Number of Women	METHOD				
		IUD	Pill	Shot	Surgery	Foam
PARITY = 1						
Never in system:						
White	443	26.4	66.4	1.6	.2	5.4
Non-white	4349	28.8	65.3	1.9	.1	3.9
Ever in system:						
White	15	insufficient data				
Non-white	186	32.8	54.9	3.8	1.0	7.5
PARITY = 2						
Never in system:						
White	255	31.4	56.5	4.3	2.3	5.5
Non-white	1650	29.9	58.6	5.6	1.4	4.5
Ever in system:						
White	39	insufficient data				
Non-white	560	38.2	47.4	8.6	2.7	3.1
PARITY = 3						
Never in system:						
White	404	32.6	41.4	9.9	12.4	3.7
Non-white	2343	31.2	46.6	11.8	10.0	.4
Ever in system:						
White	64	31.2	32.9	18.7	17.2	.0
Non-white	710	27.2	34.5	17.0	16.8	4.5

very much alike for white and non-white patients.

Before turning to inter visit time, two additional problems will be considered, namely, method switching and agency switching. The continuation rates described so far included method switchers. However, for each classification (race, parity, . . .) we also determined the percentage of women who, although continuing in the system, switch to another method. These percentages will not be shown here for lack of space. Instead more aggregate information on method switching is given in Table 9, which shows the percentage of women who remain loyal to the method chosen on their previous visit across agencies, parities and races. Percentages for IUD indicate a considerable amount of dissatisfaction with that method. Close to 20 percent switch on visit continuation 1-2, and the percentage increases to nearly 30 percent for continuation 5-6. Of those women switching from IUD to some other method, approximately 70 percent decide on pill as their new method, and 15 percent each for shot and foam. We should emphasize that dissatisfaction with a particular method may not just lead to a considerable amount of method switching, but may also have a higher dropout rate as result. Pill and shot patients display very high degrees of method loyalty. We would thus expect dropout rates for IUD patients to become higher than for pill and shot patients.

In planning clinic visits, the administrator needs to have some idea of how many people will make their next visit at another clinic or agency. By clinic switching we mean people who do not return to the

TABLE 9:
Percentage of women returning for their next visit who continue on the same method.*

METHOD	VISIT NUMBER				
	1-2	2-3	3-4	4-5	5-6
IUD	80.3 (522)	77.1 (553)	74.5 (353)	74.5 (239)	70.6 (143)
Pill	89.3 (2351)	94.1 (1547)	95.6 (1350)	96.7 (1489)	96.9 (1971)
Shot	96.5 (313)	95.8 (336)	94.5 (329)	94.9 (296)	94.2 (256)

* In parentheses the number of visits on which percentages are based. Only visits made between 7/1/69 and 6/30/70 were used for this table.

TABLE 10:

Percentage of women continuing in the system who visit the same agency. *

AGENCY	VISIT NUMBER				
	1-2	2-3	3-4	4-5	5-6
GRADY HOSPITAL	88.8 (3369)	76.9 (1521)	94.4 (860)	96.1 (708)	95.6 (580)
PLANNED PARENTHOOD	95.5 (467)	96.8 (618)	95.3 (677)	97.6 (874)	97.1 (1425)
COUNTY CLINICS	97.0 (200)	94.6 (427)	94.4 (589)	94.0 (521)	93.4 (427)

* In parentheses the number of visits on which percentages are based. Only visits made between 7/169 and 6/30/70 were used for this table.

clinic where they obtained service on their previous visit, but who come to a clinic of the same agency. Agency switching will occur when a patient visits clinics of different agencies on two consecutive visits. In this paper we only looked at agency switching. Table 10 shows the percentage of people whose consecutive visits occur at the same agency. The percentages are generally quite high, with the exception of Grady Hospital on visit continuation 1-2 and 2-3. This is primarily because of referrals from Grady Hospital to either Planned Parenthood or the County Clinics.

Distribution of Inter Visit Time

Visit continuation rates are of limited use unless it is also known when continuing patients are expected to make their next visit. One would be tempted to assume that a patient will come back around the time of her next appointment. The inter visit time would thus be approximately one year for IUD and three or six months for pill (depending on agency policy). Family planning patients have a tendency to come earlier than their appointments indicate, and this is especially true for IUD. Table 11 shows the percentage of non-white pill patients making visits within certain fractions of the time to the next appointment. The meaning of these fractions is perhaps best illustrated with an example. Take an IUD patient who visits a clinic on June 3, 1968 and is asked to return a year later. She then makes her next visit on August 15, 1968. The time to her next appointment was 12 months, but she returned after a little over 2 months. Thus this person will be classified as having made a visit within a fraction less than or equal to .25 of the time to the next appointment. The

TABLE 11:
Distribution of inter visit time for
non-white pill patients

CLASSIFICATION	% women making visits within specified fraction of the time to the next appointment				
	≤.25	≤.50	≤.75	≤.90	Between 0.90 and 1.10
PARITY = 0					
GRADY HOSPITAL					
Post Partum					
Seen immediately	14	27	37	57	20
Not seen immediately	17	19	32	49	33
Non Post Partum	16	27	36	52	20
PLANNED PARENTHOOD	6	10	22	46	39
COUNTY CLINICS					
PARITY = 1					
GRADY HOSPITAL					
Post Partum					
Seen immediately	11	22	35	52	28
Not seen immediately	9	15	24	46	32
Non Post Partum	10	18	27	49	28
PLANNED PARENTHOOD	4	7	18	48	35
COUNTY CLINICS	3	16	24	39	37
PARITY = 2					
GRADY HOSPITAL					
Post Partum					
Seen immediately	12	22	32	51	26
Not seen immediately	8	13	23	44	33
Non Post Partum	12	20	29	49	26
PLANNED PARENTHOOD	4	8	15	46	42
COUNTY CLINICS					
PARITY = 3 or more					
GRADY HOSPITAL					
Post Partum					
Seen immediately	9	18	29	49	30
Not seen immediately	6	12	21	44	32
Non Post Partum	10	17	25	45	30
PLANNED PARENTHOOD	7	12	22	54	34
COUNTY CLINICS	3	10	17	40	38

All percentages shown are based on a total of at least 50 women. They are based on all inter-visit times, excluding the first interval, namely, that between the initial visit and the one immediately following it.

time interval between the initial visit and the next is excluded in deriving the distributions of inter visit time because initial visit records in the Atlanta system did not show the time of the next appointment at the time of this analysis.[9] On an aggregate basis (all agencies and all parities combined), 16 percent of non-white pill patients come within a fraction less than or equal to .50 of the time to their next appointment. The corresponding percentage for IUD is 53 percent. And 37 percent of all non-white IUD patients make their next visit within a fraction .25 of the time to their next appointment. Figure 9 is a histogram of pill inter visit time (based on 14,825 observations), and Figure 10 is a histogram of IUD inter visit time (based on 3,474 observations). The mean ratio (time between visits) / (time to next appointment), is 0.94 for pill patients and 0.69 for IUD patients.

Distinguishing between agencies we observe that the percentage of women making visits in the range .75 to 1.25 around the appointment time is higher at Planned Parenthood than at Grady Hospital (see Figure 11). The reason why more Planned Parenthood patients make visits in a given range around their appointment time could be differences in procedures of reminding patients of a forthcoming appointment.

Figure 11 also shows that higher parity patients have less tendency to come early or late relative to their appointment than do low parity patients.

No discernible differences were found between distributions of inter visit time for white and non-white patients.

Similarly, the distribution of inter visit time stays roughly

Figure 9:
Distribution of inter visit time for
non-white pill patients.

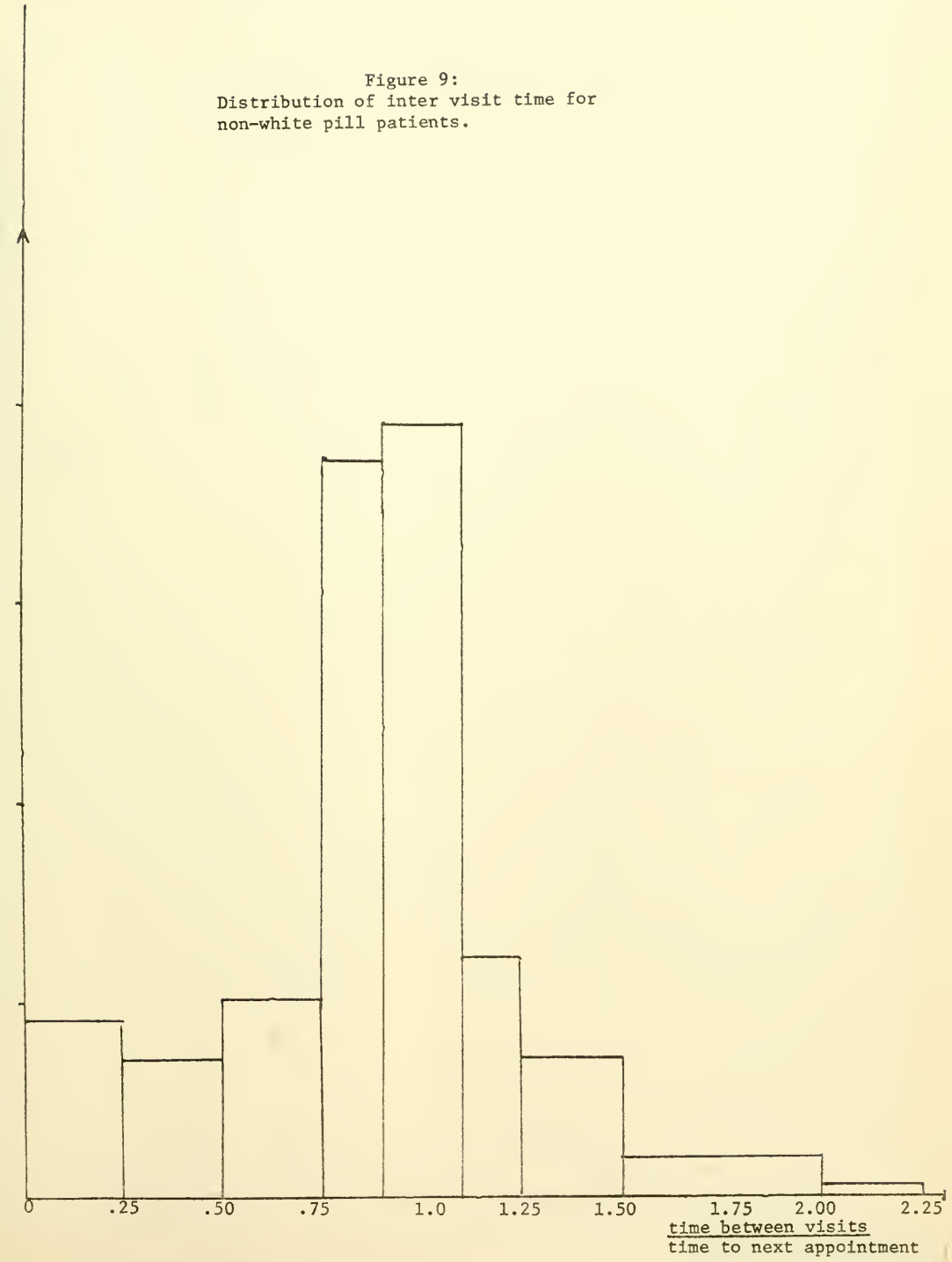


Figure 10:
Distribution of inter visit time for non-white IUD patients.

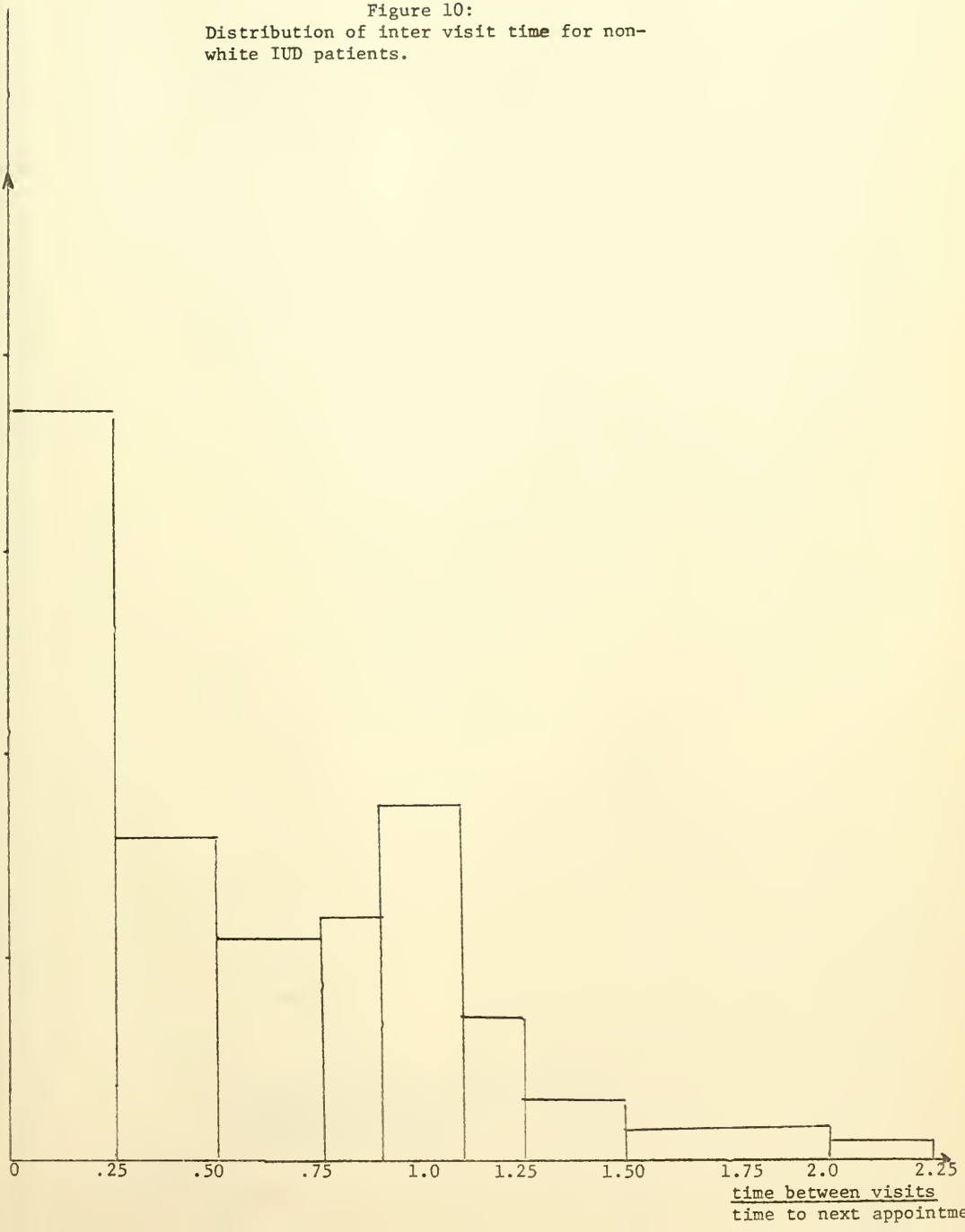
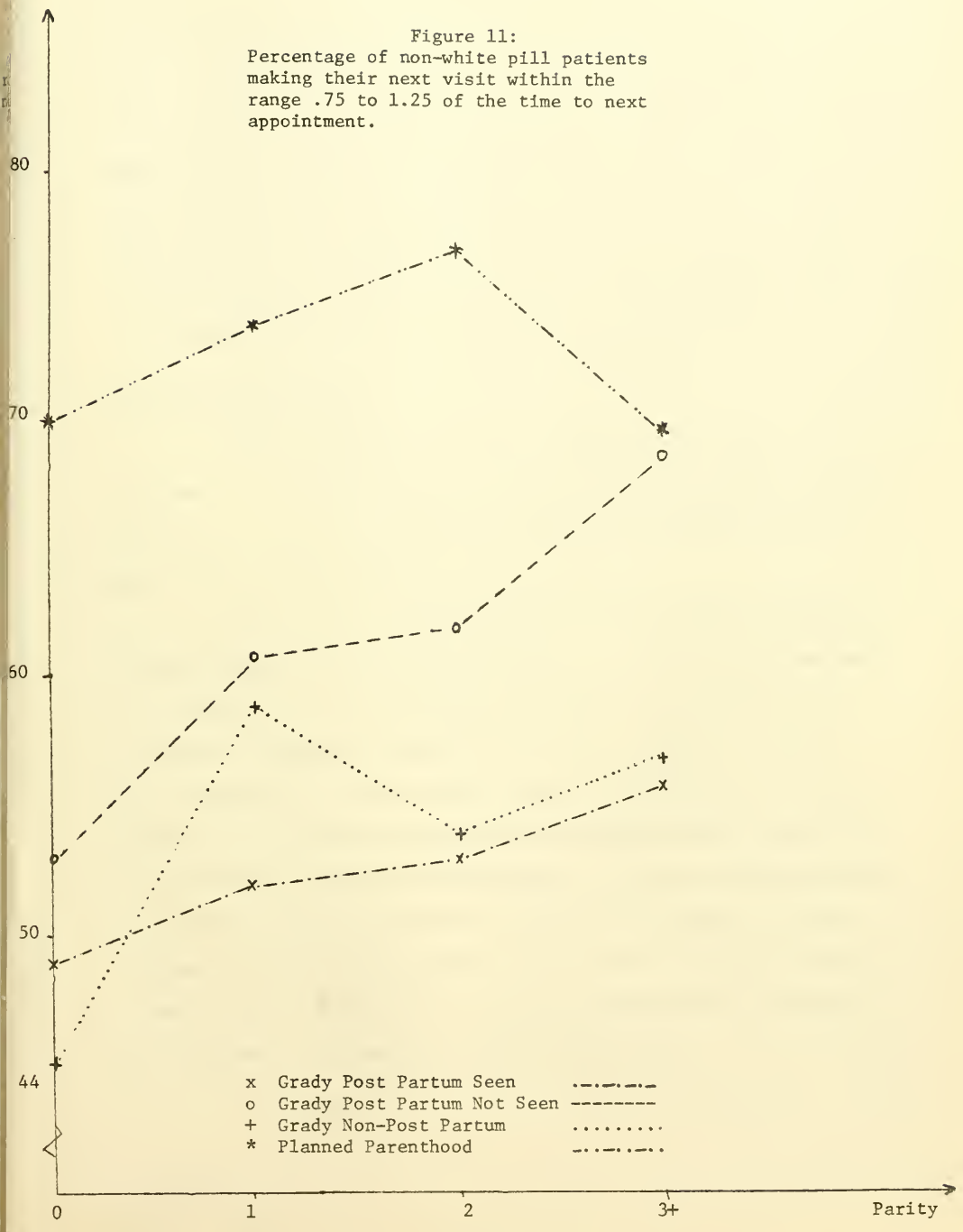


Figure 11:
Percentage of non-white pill patients making their next visit within the range .75 to 1.25 of the time to next appointment.



the same between visits 2 to 3, 3 to 4 and so on.

A final question remains, namely, does the distribution of inter visit time vary according to the length of time to the next appointment? We did not study this problem for IUD and pill. We did find, however, that for shot patients the distributions are different. Patients who are given three month appointments tend to make their next visit later than the appointment indicates, whereas patients with six months appointments make visits earlier than they are supposed to.

Managerial Implications

Visit continuation rates and distributions of inter visit time may be interesting in their own right, but the "so what" question needs to be raised and answered in a satisfactory manner in order to make it all worthwhile.[10]

First of all, visit continuation rates classified along the several dimensions (race, agency, parity, . . .) discussed above make it possible for the family planning administrator to forecast more accurately the number of people who will visit a clinic in a given future period. The following simple example should make this clear. Suppose that in a particular month 100 women making their initial visit at the Grady Hospital Post Partum clinic,are seen for the first time six weeks post partum, and decide on pills as their method of contraception. How many of these women will make a return visit? The answer depends on the composition of this group of patients. Let us consider the following two alternative patients compositions.

		Case 1	Case 2
White:	Parity 0	20	5
	Parity 1	20	5
	Parity 2	10	5
	Parity 3+	10	5
Non-White:	Parity 0	10	10
	Parity 1	10	20
	Parity 2	10	20
	Parity 3+	10	30

Based on the visit continuation rates presented in this paper, we may expect 43 patients to return for their second visit if the patient composition is as in Case 1, whereas in case 2, 52 patients are expected. The example is of course, a contrived one, but illustrates how visit continuation rates can be used to forecast and plan clinic visits. Furthermore, the example emphasizes the importance for the Family Planning administrator to classify patients and visit continuation rates according to the dimensions found in this study to be relevant. To more fully exploit the potential of visit continuation data, however, a model of how patients flow in and out of the system is needed. Such a model is being developed by Urban and his associates at M.I.T.[11] That model will help the administrator in planning by providing him with information on how many patients he will need to serve in future periods and what methods these patients will choose.

Secondly, visit continuation rates may provide useful guidelines in evaluating program performance. First of all, they make possible to carry out such evaluations on a ceteris paribus basis. For

example, suppose that for purposes of future funding, one wants to compare the performance of two agencies, say A and B. Suppose further that both agencies have roughly the same percentage users of various methods, and also that they have similar parity structures. Now, the family planning evaluator finds that agency B has significantly lower visit continuation rates than agency A. Can we conclude that agency A does a better job in getting its patients to make return visits? The answer is no, because some other relevant dimensions may not have been accounted for. For example, if agency A's patient load consists of 80 percent non-white patients and 20 percent white patients, whereas agency B has approximately 50 percent of each, then, other things being equal, we would expect agency A's visit continuation rates to be higher than agency B's. Thus the comparison of visit continuation rates at various agencies after accounting for possible differences in the composition of patients, makes evaluation of agency performance more meaningful.

Thirdly, visit continuation rates may point to problems worth investigating regarding the allocation of follow up effort. We should add immediately that looking at visit continuation rates will not solve any such problem, but merely indicates where further effort may prove useful. Consider for example a group of 200 Grady Hospital Non Post Partum Non-White Pill patients, one hundred of which have parity one, the other hundred have parity 2. Using the visit continuation rates in Table 1, we expect that 52 of the parity 1 patients will not make a second vist, as will 42 of the parity 2 patients. Suppose now that an incremental x dollars becomes available for follow up effort on those pa-

tients who do not make a return visit. How can the money best be allocated between parity 1 and parity 2 patients? The visit continuation rates induced us to raise the question, but are of no help in answering it. Although more parity 1 than parity 2 patients dropped out, we cannot say that less effort will be required to bring one additional parity 1 patient back into the family planning system than it will be to return a parity 2 patient. On the contrary it may be easier to convince a defaulting parity 2 patient to make a return visit, simply because fewer parity 2 women may desire additional children. Also, other factors need to be considered when deciding how to allocate follow up effort. For example, even if it costs more to bring back into the system an additional parity 1 patient, it may be worth doing so if it means a higher reduction in the fertility rate. In contrast to the use of visit continuation rates for the purpose of forecasting and planning, we need to know why people become inactive when our problem is the allocation of follow up effort. [12] Some factors not in any way related to family service may account for a considerable proportion of the patients who discontinue. For example, a study by Satterthwaite indicates that of those women discontinuing pills within a two year period, 15 percent had moved [7].

One area of concern to people responsible for the allocation of follow up effort should be the low values of visit continuation rates 1-2. It would be interesting to observe whether some shifting of resources could improve the total performance picture of an agency. For example, would program effectiveness increase if less resources were spent on outreach effort directed at bringing in new patients, and using these sav-

ings to step up the follow up effort directed at increasing the number of women who make the transition 1-2. One easy method for motivating people to make their second visit is used extensively in post partum programs. Approaching women who are still in the maternity ward usually leads to a high proportion enrollment in the program and considerably improves the percentage women who make at least one return visit, primarily because of the six weeks post partum examination visit. We did not find, however, evidence that these "seen immediately" patients have a better continuation record than "not seen immediately patients". On the other hand, exposing patients to family planning before they are discharged from the hospital may well be a worthwhile effort because if the first exposure occurs at the six weeks examination, a considerable number of women, namely, those who do not return for their six weeks post partum visit, will have received no family planning program exposure at all.

Finally, visit continuation rates may be helpful in determining the desirability of certain policy changes. A few examples will illustrate this point. Earlier we mentioned differences in visit continuation rates between various agencies even after accounting for differences in patient load composition. If, for example, continuation rates for agency A are better than for agency B because patients at agency B have to wait much longer to be served, then either facilities and personnel at B should be expanded, or, if excess capacity exists at agency A, more referrals could be made from agency B to agency A. It goes without saying that, for such a policy of stepped up referrals to be workable, some degree of coordination of family planning service effort of the various agencies is necessary.

More personalized service could be another reason why agency A performs better than agency B. More personalized service is, however, more expensive and a decision to adopt such a level of service should be made on a cost-benefit basis.

Distribution of inter visit time also raises the question of possible policy changes. When a considerable number of those women making early visits have no medical reason for doing so, the family planning administrator should consider the possibility of changing the current policy of reminding a patient of a forthcoming appointment. Experimentation is needed to determine whether alternative reminder procedures would be cost-effective.

The time to next appointment itself also deserves attention. If that time is too long, people may forget when they made their last visit, or when they are supposed to come back. This may cause people to make early or late visits. Furthermore, patients may have a need to be seen more than once a year (for IUD patients for example) to keep motivation high enough for them to continue in the system. This would induce people to make their visits early. On the contrary, when appointments are too frequent, more people may make late visits. The change in distribution of inter visit time for shot patients when the time to next appointment changes is a case in point.

Summary and Conclusions

In this paper we have studied visit continuation rates and the relevant dimensions along which to segment the population of users.

Important dimensions were found to be method, visit number, race, agency, parity, and ever in the system versus never in the system. The study of inter visit time revealed that a very large percentage of IUD patients make their visits earlier than expected.

Emphasis was placed on the meaning of visit continuation rates for the family planning administrator in relation to how he can put these rates to use. Managerial implications were discussed in the areas of forecasting and planning, program evaluation, allocation of follow up effort and policy making.

As a final note we should mention that an enormous amount of data is required to obtain meaningful values for visit continuation rates. In most of the study we distinguished between two rates, five methods, five agencies, five visit numbers and four parity levels. That makes 1,000 different classes. Adding the never versus ever in the system classification brings the total number of categories to 2000. Of course, some of these are redundant. For example, for surgery patients we only need to know how many choose this method. Continuation rates 4-5 and 5-6 are not very different, so considering four visits might well be sufficient. But even with these and other reductions, many classes remain and large quantities of data are needed to estimate the various continuation rates. We would therefore, hope that some of the results obtained here can be used in programs other than Atlanta, that have similar characteristics or where some parts of the system are comparable. For example,are visit continuation rates at two urban Planned Parent-

hood clinics similar for white pill patients who make their first visit and have parity 2? Answering this type of question calls for the comparison of continuation rates for different programs that satisfy the data availability requirements. The problem should be of interest to National Family Planning administrators who are responsible for evaluating requests for funds from a variety of programs, who then allocate funds to various programs, and would like to measure the progress of program performance.

FOOTNOTES

[1]This is one of various possible definitions. For the comparitive purposes of this paper, any definition which is consistent across the various dimensions referred to earlier (race, agency, parity, ...) is adequate. It may be emphasized that the definition used here eliminates the problem of lack of information about prospects.

[2]Major emphasis in this paper will be on IUD and pill. Only cursory remarks will be made on shot, foam and surgery. Most of the ensuing discussion will use continuation rates for non-white patients because of the larger number of data available.

[3]Similar results were obtained by Kachirayan who reported higher dropout rates for white patients than for non-white patients at Grady Hospital for both IUD and pill. See [5], p. 16.

[4]Conversation with Dr. Ronald W. O'Connor. We might add that several authors have pointed out that offering family planning services to maternity patients has the important side benefit of substantially increasing the number of women returning for post partum examinations. See for example Beasly [1] and Tepper [8].

[5]With pure six weeks post partum patients, we mean those women who, although not interested in further family planning service, return to the clinic to get a six weeks post partum checkup.

[6]In a later section we will emphasize the importance of distinguishing between expected inter visit time, as implied by the appointment given, and actual inter visit time.

[7]The difference in continuation rates 1-2 for each parity separately is not statistically significant. Looking at the pattern of the continuation rates over all parity levels, however, shows statistical significance in the differences of continuation rates between County Clinics and Planned Parenthood.

[8]Although it is the patient who ultimately decides what method to use, her choice is heavily influenced by the advice given her by the family planning personnel.

[9]This has been changed as of January 1, 1971.

FOOTNOTES
(Continued)

[10]For an enlightening discussion of the importance of the "so what" question in relation to the enormous amount of detail in public sector data, see Ida R. Hoos [4].

[11]For a good description of this model see Urban [9], and O'Connor [6].

[12]Bogue [2] has stressed the importance of systematically studying the reasons why people drop out of family planning programs.

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