The Effect of “Magic” Johnson’s HIV Disclosure on Anonymous HIV Counseling and Testing Services in New York State

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Introduction

It has been established that people will respond, with both attitudinal and behavioral changes, to highly visible public-health campaigns. Consider the sustained anti-smoking campaign in the US. Through a variety of communication channels and marketing strategies, Americans have been made aware that cigarette smoking is detrimental to their health. As a result of this long-term, multi-channeled campaign, knowledge increased and behavior changed as well. The percentage of smokers in the US has greatly decreased.¹

Organized attempts, through extensive media coverage, have been successful at altering the way Americans view and react towards AIDS as well. Intermittent programs such as the federally sponsored America Responds to AIDS Campaign (ARTA) have been launched to increase knowledge and decrease risky behavior associated with contracting the disease. This multi-phase public-service campaign, begun by the Centers for Disease Control (CDC) in 1987, has employed a variety of marketing techniques to reach its target audience (the entire American public). High-level public-health officials such as US Surgeon General C. Everett Koop conducted news conferences. Video news releases on AIDS were created for airing on national and local television stations. An AIDS-fact-related brochure entitled Understanding AIDS was disseminated to every household in the US.² Evaluations of various phases of this campaign indicate that the CDC has indeed been successful at increasing America’s basic knowledge and even behavior regarding AIDS.³

Along with an increased public awareness of AIDS has come a pervasive fear of the disease and its modes of possible transmission in the US and in other countries.⁴ We know that these fears are often irrational and often are held by groups at low risk for contracting the disease.⁵ A recent CDC study has shown that both knowledge and fear of AIDS have increased as a result of recurrent media attention to the topic.⁶ Some have questioned the wisdom of mass marketing AIDS information to all segments of a population. One article notes that such campaigns increase fundamental knowledge about AIDS but also raise unnecessary anxiety among low-risk populations as an unintended consequence.⁷

The Study

Here we analyze the impact of a single, unplanned AIDS intervention—Ervin “Magic” Johnson’s HIV disclosure—on the public and the resulting utilization of counseling and testing services. Because of the increased public awareness of AIDS as an important national issue, and because fear of the disease has increased, the repercussions felt throughout American society when Magic Johnson announced that he had tested positive for HIV were not unexpected. The 7 November 1991 announcement by the Los Angeles Lakers basketball superstar sent the price of Magic Johnson souvenirs skyrocketing.⁸ National Basketball Association (NBA) officials moved to provide more information about AIDS to their players, and talk of mandatory AIDS testing for professional athletes was revived.⁹

Because he was the most famous American sports celebrity known to be infected with the virus,
Magic's shocking announcement had effects well beyond the NBA. Stock prices of US condom makers and companies engaging in AIDS-related research dramatically increased immediately following the announcement, amid speculations that the disclosure could have long-term ramifications concerning how people with AIDS are perceived. In the nation's capital, lobbying efforts for increased government spending on AIDS research were stepped up in the wake of the announcement. President Bush asked Johnson to fill a vacant seat on the National Commission on AIDS. AIDS organizations around the nation inundated Johnson with pleas for assistance in their efforts to combat the disease.

Although they had reacted listlessly to the AIDS disclosures of other professional athletes, people throughout the nation responded to this widely known and popular celebrity's announcement. Nowhere was this response more evident than in our nation's AIDS counseling and testing centers. Immediate and substantial increases in program workloads were experienced. Calls from concerned citizens flooded AIDS hotlines in large cities across the nation. The CDC reported that calls to their AIDS hotlines increased from an average of 4,000 calls per day to over 25,000 calls in the days following Magic's announcement. Moreover, they reported that two weeks after the disclosure, calls were still far above previous levels. Similar increases were reported by AIDS centers in Los Angeles, Portland, New York, and Houston.

Many counseling and testing centers in Los Angeles and surrounding counties reported that they were out of testing funds even though the fiscal year was only half over. This suggests that people were not only calling more, but they were also seeking testing at higher than anticipated rates. Officials blamed this shortage on the incredible public response to the Magic Johnson announcement. There were also some indications that the demographic profile of the typical AIDS-counseling client had changed immediately following the announcement. The AIDS Project of Los Angeles (APLA) reported that the percentage of heterosexuals and other “low-risk” individuals being tested had been increasing in the months preceding Magic's announcement, but that this percentage dramatically increased in the weeks following the announcement.

Aside from the aforementioned newspaper articles suggesting a large impact on AIDS counseling and testing centers stemming from Magic Johnson's HIV disclosure, there has yet to be any controlled scientific inquiry into precisely what effect the announcement has had on such centers. In fact, there has been only one published article concerning Magic Johnson's HIV disclosure. This study, which employed a small convenience sample of male passengers waiting in Chicago's mass-transit system, measured men's attitudes towards AIDS before and up to ten days after the Magic Johnson HIV disclosure. The authors found significant increases in the men's desire to obtain more information about AIDS, and in their concern about acquaintances contracting the disease, in the days following the announcement. Moreover, they found that the disclosure had a larger effect on black men, who indicated that the announcement increased their concern about AIDS to a larger degree than white men reported.

This study attempts to answer five basic questions: (1) Exactly how large an effect did Magic Johnson's announcement have on AIDS hotline calls, appointment backlogs, and blood submissions? (2) Did the announcement cause programs to increase their working hours to help deal with the increases in services demanded? (3) Did Magic's announcement have an impact on the risk characteristics of AIDS counseling and testing clients? (4) Did the proportion of lower risk clients being tested? and (5) How long did any of these effects last?

Data and Methods

Sample Population

The data were drawn from the aggregated weekly reports of all sixty-one AIDS Institute Anonymous Counseling and Testing sites in regions throughout New York State from February 1991 to March 1992 (fifty-five weeks of data overall). At the end of each week, counselors from each program are required to report basic program, client, and workload information. Weekly aggregate and program-level descriptive reports are generated and disseminated back to the programs, which use the reports to help allocate counseling resources among their sites.

Virtually all cases originate from an initial hotline call to one of the program's AIDS hotlines. Clients may also learn about the services of the Anonymous Counseling and Testing Program through referrals from other programs, from posters and other program literature, and from listings in telephone directories.

Typically, appointments are scheduled and clients are given an interview date to receive pretest counseling. This counseling consists of providing basic information about AIDS, including discussions of the types of behaviors associated with
an increased risk of acquiring HIV, a description of the HIV test, and a discussion of the services available to HIV-infected individuals. All clients are assured of their anonymous status and apprised of New York State law regarding the confidentiality of test results, and virtually all decide to be tested for the presence of HIV antibodies.  

Upon their return for test results, clients are given post-test counseling, at which time they receive help in understanding the behavioral, social, and medical implications of a positive test result. Clients must receive their results in person, as no results are given over the telephone. Clients are also referred to needed medical and psychosocial services and advised of their partner-notification responsibilities. This statewide counseling and testing program counseled and tested over 23,000 clients during 1991.  

**Measurement of Variables**

Table 1 lists the variables we selected for inclusion in this analysis. Provided are variable names, a description of how the variable was computed, and each variable’s mean and standard deviation for the entire time series. To standardize the variables as much as possible, when appropriate, we adjusted for the number of working days in the week.

The variables chosen for analysis actually represent a temporal process operating within each program. We hypothesized that the number of hotline calls to AIDS counseling and testing programs would increase in the weeks after Magic Johnson’s announcement, reflecting the immediate consciousness-raising effect of a celebrity’s disclosure and subsequent high media coverage. An increase in hotline calls should result in an increase in the number of people scheduled for counseling appointments (“appointment backlog”). This, in turn, should increase the number of clinic hours that programs make available to provide counseling-and-testing services. This increase in staff operations should allow for an increase in blood submissions to occur. We expected the final dependent variable in Table 1 (“percent positive”) to decrease in

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coding of Variable</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hotline Calls</td>
<td>The number of hotline calls per agency per week*</td>
<td>107.5</td>
<td>35.1</td>
</tr>
<tr>
<td>Appointment Backlog</td>
<td>The number of people waiting for counseling appointments per agency</td>
<td>75.8</td>
<td>46.1</td>
</tr>
<tr>
<td>Clinic Hours</td>
<td>The number of counseling (clinic) hours provided per agency per week*</td>
<td>41.4</td>
<td>7.2</td>
</tr>
<tr>
<td>Blood Submissions</td>
<td>The number of clients tested for HIV per agency per week*</td>
<td>35.0</td>
<td>7.9</td>
</tr>
<tr>
<td>Percent Positive</td>
<td>The percentage of positive HIV tests per agency per week</td>
<td>4.2</td>
<td>1.1</td>
</tr>
<tr>
<td>Magic</td>
<td>Dichotomous variable coded 0 prior to the week of the disclosure and 1 afterward.</td>
<td>.35**</td>
<td>.48**</td>
</tr>
</tbody>
</table>

For the hotline-calls equation the variable is coded 1 only at the week of the disclosure. .02*** .13***

Christmas week and New Year’s week are excluded from the analysis, since program activity was very low during these two weeks due to staff vacations, limited hours, and probably low client-response rates.

* Adjusted for the number of working days per week.

** For all models except hotline calls.

*** For the hotline calls model.
the weeks following Magic’s disclosure, reflecting an increase in the proportion of relatively low-risk clients motivated to seek testing. We hypothesized that, consistent with anecdotal accounts from a few AIDS testing centers, Magic Johnson’s announcement would generate an increased awareness of heterosexual transmission and stimulate more heterosexuals (with no other risks) to seek counseling and testing.

We hypothesized that all of these variables would experience a sharp increase (or decrease for the seropositivity variable) immediately following the HIV disclosure. Furthermore, we hypothesized that the “Magic Johnson Effect” would be a fairly short-term one. We expected that all variables would have returned to (or would be returning to) their previous levels by the end of the time series, consistent with an initially strong public response but quick return to the status quo.

The last variable in Table 1 (“Magic”) represents the dichotomous intervention variable. Because of differences in model specifications (discussed below), this variable is coded for the hotline calls-model in a way that is different from the other equations.

Statistical Methods

We conducted an interrupted time-series analysis measuring the impact of the Magic Johnson disclosure on hotline calls, appointment backlogs, clinic hours, blood submissions, and seropositivity. More specifically, the intervention analysis developed by Box and Tiao based on the Box-Jenkins autoregressive, integrated, moving average (ARIMA) time-series modeling technique was employed.23

This is an iterative process, beginning with the identification of a tentative model that seeks to specify whether any autoregressive, integrated, and/or moving-average components are operating within a given time series. Next, an ARIMA model controlling for these components is estimated, and the residuals are analyzed to see if there are any systematic components remaining. If there are not, the residuals are characterized as purely random fluctuations, and the intervention component (in this case the dichotomous Magic Johnson variable) can be added to the model. If there is a change in the time series at the point of intervention, the model measures the size of the intervention effect.

ARIMA modeling allows one to specify the type of intervention impact expected. For example, we expected the Magic Johnson HIV disclosure to have an immediate impact on the number of hotline calls received, but we did not expect this effect to last more than a few weeks. Thus, an “abrupt-temporary” impact was specified. As will be discussed below, such an impact specification allows one not only to estimate the size of the initial intervention effect, but also to forecast beyond the current time series to predict when the effect of the intervention will completely disappear.24 All models were estimated using the backforecasting algorithm in BMDP2T software.25

Findings

Figures 1 and 2 plot the five time-series for the fifty-five weeks of data used in this analysis. As is clearly evident from Figure 1, there was an immediate and substantial increase in both hotline calls and appointment backlog following the week of Magic Johnson’s HIV disclosure. Hotline calls peaked a few weeks after the announcement, dropped sharply, and then declined more slowly; but they remained well above preintervention levels at the end of the current time series. Appointment backlog had not shown any consistent evidence of returning to preintervention levels by the end of the time series. The impact of the intervention is slightly less obvious for clinic hours, blood submissions, and seropositivity (Figure 2). It is fairly clear, however, that both clinic hours and blood submissions increased in the post-intervention weeks, while the percentage of seropositive test results decreased.

Table 2 summarizes the results of the ARIMA time-series analysis for hotline calls, appointment backlog, clinic hours, blood submissions, and seropositivity. For each of the series analyzed, the table reports the preintervention series average for each variable (adjusted for autocorrelation); the size of the Magic Johnson intervention effect (interpreted as an increase or decrease in each series following the intervention); the percentage change in series due to the intervention and its significance level; and, for the hotline calls equation, the estimated total impact of the intervention effect. This impact is represented by two statistics: (1) the estimated total number of hotline calls per agency due to the intervention effect and (2) the estimated number of weeks before hotline calls returned to near preintervention levels.

In order to determine whether Magic Johnson’s HIV disclosure impacted the sexes differently, time-series models for hotline calls, blood submissions, and seropositivity were estimated for males and females, separately (sex-specific tables are not reported).26 Data on appointment backlog and clinic hours were not available for males and females separately.27

As Table 2 indicates, Magic Johnson’s HIV announcement had a significant impact on all the time series examined. The mean of the
HOTLINE CALLS AND APPOINTMENT BACKLOG
(February 1991-March 1992)

Figure 1.

CLINIC HOURS, BLOOD SUBMISSIONS, AND
SEROPOSITIVITY RATES (February 1991-March 1992)

Figure 2.
hotline-calls series more than doubled in the weeks immediately following the announcement, then declined slowly thereafter. Assuming there were no other events affecting the series, we would not have expected the mean of the hotline-calls series to return to near preintervention levels until twenty to twenty-seven weeks had passed. The total number of hotline calls per site attributable to the announcement is estimated to be over 1,000. Magic’s HIV disclosure had a substantial impact on both male and female hotline calls, as rates of calls for both more than doubled following the announcement. The impact was slightly higher for females, however, as females’ hotline calls increased by 142 percent following the intervention, while the male rate increased by 108 percent.

Because there were not enough weeks of data after the intervention period, we could not test our hypothesis of an “abrupt-temporary” impact pattern for the other time series. Rather, these time series were best modeled by an “abrupt-permanent” impact pattern. One reason for this is that, unlike hotline calls that are realized immediately and constrained only by the number of hours per day programs are open, the other variables are realized a few weeks later and constrained by staff limitations. A large increase in hotline calls produces a large increase in appointment backlogs, which in turn causes an increase in available clinic hours and thus blood submissions. This increase in blood submissions allows for the possibility of an increase or decrease in seropositivity rates. These factors cannot increase as quickly as hotline calls can, however, as they are all constrained by staffing limitations. Available resources limit the amount that clinic hours can be increased in order to deal with appointment backlog. One would therefore expect a much slower return-to-normal rate for the other variables in this analysis, thus accounting for their perceived permanent-impact pattern.

Table 2 reveals that the intervention had a significant positive effect on appointment backlog, on the number of available clinic hours, and on the number of blood submissions, causing an 81 percent, a 24 percent, and a 38 percent increase in these time series, respectively. Moreover, eighteen weeks after the disclosure, there were no signs of significant decrease in any of these series.

As was the case for hotline calls, the announcement significantly impacted both male and female blood submissions, although the female rate increased slightly more than the male rate. The female rate increased by an average of 6.5 blood submissions per agency per week, a 48 percent increase over the preintervention series mean, while the male rate increased by 5.9 submissions, a 33 percent increase.

As we hypothesized, the percentage of seropositive test results decreased following Magic’s announcement. Somewhat surprising was the rate of decrease, 24 percent in the post-intervention weeks. This suggests that much of the increase in clinic activity flowing from the

Table 2
Interrupted Time-Series Results

<table>
<thead>
<tr>
<th>Time Series</th>
<th>Series Average (Pre-Intervention)</th>
<th>Estimate of Magic Johnson Intervention Effect</th>
<th>Percentage Change in Series</th>
<th>Total Impact of Intervention (Weeks to Pre-Intervention Level)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hotline Calls</td>
<td>9.17</td>
<td>111.8</td>
<td>+122</td>
<td>1016 calls (27 weeks)</td>
</tr>
<tr>
<td>Appt. Backlog</td>
<td>53.9</td>
<td>43.4</td>
<td>+81</td>
<td>--</td>
</tr>
<tr>
<td>Clinic Hours</td>
<td>41.5</td>
<td>9.9</td>
<td>+24</td>
<td>--</td>
</tr>
<tr>
<td>Blood Submissions</td>
<td>31.5</td>
<td>12.0</td>
<td>+38</td>
<td>--</td>
</tr>
<tr>
<td>Percent Positive</td>
<td>4.6</td>
<td>-1.1</td>
<td>-24</td>
<td>--</td>
</tr>
</tbody>
</table>

1 Adjusted for autocorrelation when appropriate.
2 Calculated by the following formula:
   \[(\text{Mean of series after intervention} - \text{mean of series before intervention}) \times 100\]
   \[P < .01\]
3 Refers to the total number of hotline calls resulting from the intervention, with the total number of predicted weeks until the series returned to within 5 calls of preintervention levels in parenthesis. Only applicable to hotline calls equation since an abrupt permanent impact was specified for all other series.
Magic Johnson disclosure was due to relatively lower-risk individuals coming forth for counseling and testing. It appears that Magic Johnson’s HIV disclosure and subsequent media coverage affected those individuals who were least in need of AIDS testing, at least from an at-risk perspective. Consistent with the temporal process operating among the variables, the female seropositivity rate decreased slightly more than the male rate did following the HIV disclosure. There was a 26 percent decrease for females following the intervention and a 21 percent decrease for males. That is, proportionately more females made hotline calls following the announcement, and thus proportionately more females submitted blood. This, in turn, allowed for more of an effect on female seropositivity following the announcement.

To determine if there were any geographic differences in the Magic Johnson effect, we repeated the analysis, separating New York City programs from programs located elsewhere in New York State. The results indicated that the Magic Johnson HIV disclosure had significant effects on the workloads of the New York City program as well as on the workloads of programs located outside New York City. The effects were slightly stronger for the New York City programs, however (tables not included). The male and female trends reported above held within both regions examined.

Discussion and Policy Implications

We determined that Magic Johnson’s HIV announcement had a substantial impact on hotline calls, appointment backlogs, available clinic hours, blood submissions, and seropositivity. With the exception of hotline calls, which have begun to show signs of decreasing in the weeks following the announcement, we found no evidence of any decrease in the other variables examined here, four months after the HIV disclosure.

There are a number of possible reasons for this lack of decline. One reason is that, unlike hotline calls, which have virtually no carry over from day to day, the other variables examined here do not reflect current client demand for services. These variables reflect demand that was generated a number of weeks earlier and that are constrained by staff availability. This implies that simply not enough weeks have passed since the initial disclosure to observe a decrease in these variables.

Another possible factor is that Magic’s continued commitment to AIDS education and the sustained media coverage surrounding him is causing a continued interest in AIDS issues several months after the initial disclosure. Related to this, events occurring since Magic’s HIV disclosure, such as former tennis star Arthur Ashe’s AIDS announcement, may be serving to help sustain public interest in HIV counseling and testing.

Hence, disclosures of HIV infection by celebrities influence testing by the public. But these findings do not indicate that they influence already infected persons to be tested. Thus, the major impact of these attention-getting announcements is probably their effect on worried but predominantly uninfected individuals seeking HIV-prevention information and counseling. The decrease in the rate of seropositive test results and the differential impact upon females are surprising and may indicate that policies using peers to influence peers (for example, black men) may have unexpected consequences. Further research on reference-group influences should be done to provide a better understanding of the likely effects of using celebrities as demographic peer communicators in public-service announcements.

There are other questions left unanswered by this analysis. Although seropositivity declined as a result of Magic’s announcement, we were not able to specify exactly why this was so. A small amount of this decrease in total seropositivity can be accounted for by the fact that female blood submissions rose at a higher rate than male submissions following the announcement. Since females have a lower background positivity rate, we would expect a decrease in the overall rate of seropositivity.

However, since both male and female seropositivity rates dropped in the wake of Magic’s disclosure, other factors obviously have been driving seropositivity since the 7 November disclosure. Newspaper articles suggest that the testing rate for heterosexuals has increased dramatically since Magic’s announcement. It is likely that the Johnson announcement heightened awareness among heterosexuals of their risk for HIV from unprotected sex, thereby generating an increased demand from this risk population. The prevalence of infection in that population is lower than that among other risk groups (for example, IV-drug users and homosexuals). Another likely factor is that the proportion of IV-drug users being tested at anonymous sites has decreased since Magic’s announcement, thereby creating a decrease in seropositivity.

Although a high proportion of those affected by the Magic Johnson disclosure were most likely heterosexuals and other “lower risk” individuals, it is unquestionable that his disclosure has had the effect of drastically increasing the number of people availing themselves of AIDS counseling-and-testing services in New York State. Moreover,
to the extent that these people pass their new knowledge on to their sexual partners, friends, and family members, some of whom will be higher-risk individuals, the overall prevention effects of Magic’s announcement eventually could be very beneficial.

Although studies on the effects of AIDS counseling traditionally have been limited to those in higher-risk pools, there is evidence from those studies to suggest that AIDS education can produce positive effects on an individual’s attitudes and even behaviors regarding high-risk sexual and drug-related activities. To the extent that such studies can be generalized to those individuals in lower-risk groups, and to the extent that Magic Johnson’s announcement eventually will have an impact on those engaging in higher-risk behaviors, there is hope that Magic Johnson’s effect will be more than a superficial one.

On the other hand, one could argue that the “Magic Johnson Effect” has been characterized by the consumption of scarce and valuable AIDS counseling and testing resources by those who are least in need of such services. According to this view, AIDS-hotline counselors should attempt to allay unwarranted public panic in the wake of major-media events such as the Magic Johnson incident. AIDS hotlines should focus on transmitting risk-related information to callers and only schedule testing appointments for those individuals who still believe they are at risk for being infected with the AIDS virus.

There is no doubt that the reason public interest in AIDS education and testing increased so drastically immediately following Magic’s announcement had to do with the man making the disclosure. More than any previous celebrity disclosing that he or she had HIV, Magic Johnson is an American icon.

Whether or not he will be credited with causing more than an initial, temporary public interest in AIDS should be the subject of future research. In the future, we will undertake research to attempt to specify the race/ethnic and risk-related correlates of testing and seropositivity in the wake of Magic Johnson’s HIV disclosure. We will address these issues as individual-level data from the relevant time frame become available.

Acknowledgments

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NOTES

2 Ibid.
10 Bray and Chapman, “Community Knowledge,” 112.
15 Magic Johnson has recently resigned from this position.
17 These include the following sports stars who have died of AIDS: Jerry Smith, former All-Pro tight end for the Washington Redskins; Esteban DeJesus, former WBC lightweight champion; and Tom Waddell, a former Olympic decathlete.
23 Ibid., 1376.
24 Over 99 percent of all counseled clients agreed to be tested in 1990.
25 New York State Department of


24 ARIMA modeling is similar to Ordinary Least Squares Regression Analysis, except it has the major advantage of being able to control for any autoregression, non-stationarity, or moving average components so typically present in time-series data. These effects lead to biased estimates of the standard errors of the parameter estimates, thereby rendering tests of statistical significance biased (usually in the direction of increasing the likelihood of committing Type I error).


26 Because the time-series analysis controls for autocorrelation processes, the “Total Series” models will not necessarily equal the sum of the “Male” and “Female” time-series models.

27 Key statistical elements are available from the authors upon request.

28 This figure did not change throughout the study period.

29 Magic’s recent decision to return to basketball will undoubtedly serve to keep him and the issue of AIDS in the public light.