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Socio-Demographic Factors Associated with Relapse in Drug and Substance Abuse Among Reformed Drug Users at Karuri Level 4 Hospital in Kiambu County, Kenya

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Abstract

Relapse in drug and substance abuse remains a significant public health concern in Kiambu County, Kenya, despite the expansion of Medication-Assisted Treatment (MAT) services. This study aimed to examine the influence of socio-demographic factors on relapse among patients attending the MAT clinic at Karuri Level 4 Hospital, Kiambu County. A cross-sectional design was employed among reformed drug users enrolled in MAT. Socio-demographic variables, including age, gender, marital status, education level, employment status, and household composition, were analyzed in relation to relapse outcomes. Chi-square analysis revealed statistically significant associations between relapse and selected socio-demographic characteristics, notably age and gender. The findings indicate that younger patients and those with unstable livelihoods were more vulnerable to relapse (OR = 0.95, p = 0.012). Equally, Gender had a notable effect, with males having more than twice the odds of relapse compared to females (OR = 2.12, p = 0.012). Additionally, education level was protective, with higher education levels associated with a 26% reduction in the odds of relapse (OR = 0.74, p = 0.012), demonstrating the stabilizing effect of education on recovery. The study concludes that socio-demographic characteristics play a critical role in relapse among MAT clients. It recommends adopting demographic-responsive treatment approaches, including targeted follow-up for high-risk groups, integrating livelihood support, and strengthening social support mechanisms to achieve sustained recovery outcomes.

Keywords: *Age, Gender, Education level, Relapse, Drug and Substance Abuse, Reformed Drug Users*

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1. Introduction

Drug and substance abuse remains a major global public health concern, characterized by harmful and patterned use of psychoactive substances that impair individual and societal functioning. Recent evidence shows increasing substance use worldwide, with children as young as 12 years entering treatment for dependency (UNODC, 2019). Relapse, defined as the resumption of substance use following treatment or abstinence, continues to challenge recovery outcomes, as individuals frequently experience cravings and behavioral triggers that undermine

sustained abstinence (Menon et al., 2018; Marlatt, 2019). Empirical studies indicate that relapse is a multifactorial process influenced by interacting psychological, social, and behavioral factors rather than a single cause (Connors, 2017).

Globally, treatment coverage remains inadequate, with only 4.1 million of the 22 million individuals requiring substance use treatment accessing care, and emerging adults aged 18–35 years exhibiting the highest relapse rates (SAMHSA et al., 2016). Relapse prevalence exceeds 40% in high-income countries and continues to rise across Europe, Asia, and Africa, often compounded by co-occurring mental health conditions (Shonkoff & Garner, 2017; SAMHSA, 2019).

In Africa, treatment admissions related to substance use and relapse have increased markedly, as evidenced by rising cases reported in South Africa (SACENDU, 2022). In Kenya, drug and substance abuse has escalated despite sustained prevention and treatment efforts. National data reveal early initiation, high youth involvement, and increasing relapse rates, with alcohol, tobacco, khat, and cannabis being the most commonly abused substances (NACADA, 2018; NACADA, 2019; NACADA, 2023). These trends underscore the need for context-specific evidence to inform targeted interventions to reduce relapse and improve recovery outcomes.

1.1 Problem Statement

Drug and substance abuse relapse remains a major global public health concern, contributing significantly to mortality, morbidity, and socio-economic instability (Liebenberg, 2017; WHO, 2016). Alcohol and drug use alone account for millions of preventable deaths annually, while treatment outcomes are frequently undermined by high relapse rates, particularly within the first year of recovery (WHO, 2019; Polich et al., 2020). Evidence indicates that relapse is closely associated with individual and contextual characteristics, including age, gender, social environment, and economic status, highlighting the need to examine socio-demographic determinants in relapse prevention efforts.

In Africa and Kenya, relapse prevalence remains high, with studies demonstrating variation across age groups, gender, and social contexts (Beanery, 2019; Wesson, 2019; Kuria et al., 2017). In Kenya, one in six individuals uses at least one psychoactive substance, and relapse rates exceed 40%, often occurring within six months of treatment (Durazzo & Meyerhof, 2017; NACADA, 2025). Kiambu County ranks among the most affected regions, with substantial drug-using populations and elevated relapse risk due to its demographic composition and proximity to Nairobi (NACADA, 2023). This study, therefore, investigated socio-demographic factors contributing to relapse among clients attending the MAT clinic in Karuri Ward, Kiambu County, to inform targeted, context-specific intervention strategies.

2. Literature Review

Social-demographic factors contributing to drug and substance relapse.

2.1 Age

A study done showed that older adults were less likely to relapse following addiction treatment compared to middle and young adults (Carson *et al*., 2018). A study done in Canada found that older patients have a lower relapse rate than young patients. The study attributed the difference to other age-related factors that positively impact abstinence after treatment, such as higher self-efficacy, greater motivation, and stronger social networks among adults.

2.2 Sex

Sex differences affect relapse to substance abuse differently for both men and women (Perry *et al.*, 2016). This is due to addiction-like behaviors for both men and women, which are affected differently. The environment also affects the brain differently for both Males and females, and this leads to differences in vulnerability to relapse and addiction in the male species as compared to the female species (Becker *et al*., 2019).

During attempts to stop drug use, Women experience greater difficulties, such as seclusion from the community and unfriendliness from their partners, compared to men who are supported at home and in their working environment (Becker et al., 2019).

However, other studies found that males suffer more complications, such as withdrawal symptoms when stopping substance consumption, than women (Devout *et al*, 2019).

2.3 Genetics

The genes that people are born with account for about half of a person's risk for addiction. Substance abuse, addiction, and relapse tend to run in families, indicating genetics may have a role in causing drug addiction (National Institute of Drug Abuse, 2015). Genetic causes of drug abuse and addiction appear to involve multiple gene sequences, and science has not yet been able to pinpoint all the genes involved in addiction and relapse.

3. Methodology

The study adopted a descriptive cross-sectional study design. The target population for this study was 2,420, according to the KDHS report (2022) and confirmed by records at the MAT clinic, comprising patients captured in the relapse record books and computer-stored information. The study included Persons aged 18 years and above, former drug and substance abusers who had relapsed back into drugs, residing within the ward, and willing to participate in the study. Counselors and medical personnel at Karuri Level 4 Hospital were considered key informants for the study. Sample size was 344. The researcher added 35 participants, equivalent to 10% of the sample size, to cater for attrition, withdrawal, and loss to follow-up. This made the expected number of respondents 379.

Both structured and semi-structured questionnaires were used in the study. Data collected from the questionnaires were cleaned, coded, entered, and analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive data were analyzed using measures such as mean, median, mode, variance, and standard deviation, while inferential data were analyzed using the Z-test, regression, and analysis of variance (ANOVA). The Chi-Square test of significance was used to determine the p-values for the variables, with p-values <0.05 considered statistically significant. Odds ratios were used to assess the strength of associations between relapse and non-relapse, and between relapse and sociodemographic factors. The analyzed data were presented in tables and figures, including percentages, pie charts, and graphs.

4. Findings

4.1 Socio-Demographic factors affecting relapse

This section presents the demographic profile of the respondents who participated in the study. Understanding demographic characteristics is essential, as they provide the context for interpreting the study's findings.

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4.1.1 Gender of the Respondents

The result is presented in Figure 1.

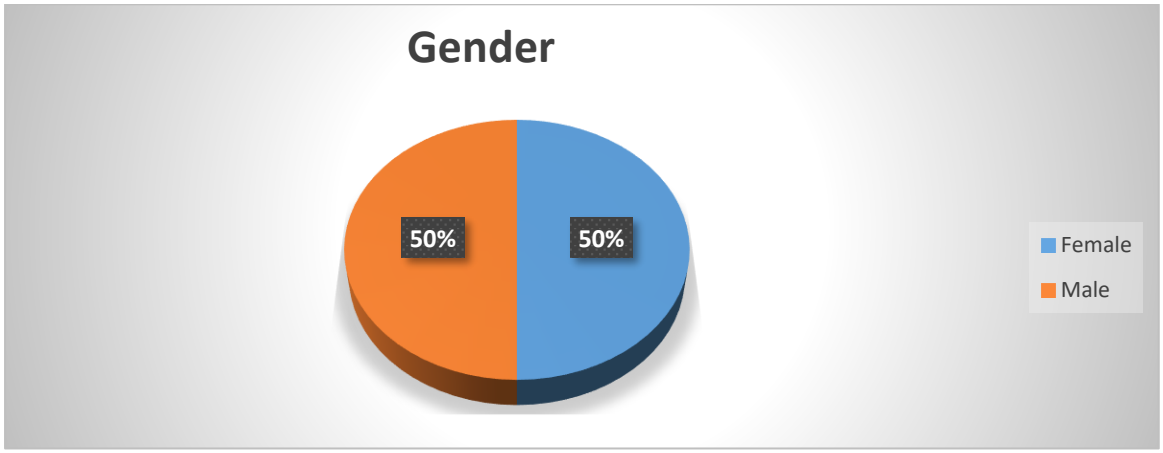

Figure 1: Gender

The result shown in Figure 1 shows equal representation of males and females. The outcome of the respondents' gender shows that substance abuse and relapse are prevalent in both sexes. However, the outcome differs from Becker et al.'s (2019) findings that biological and neurochemical responses to drugs differ between men and women, leading to varied patterns in addiction and recovery trajectories.

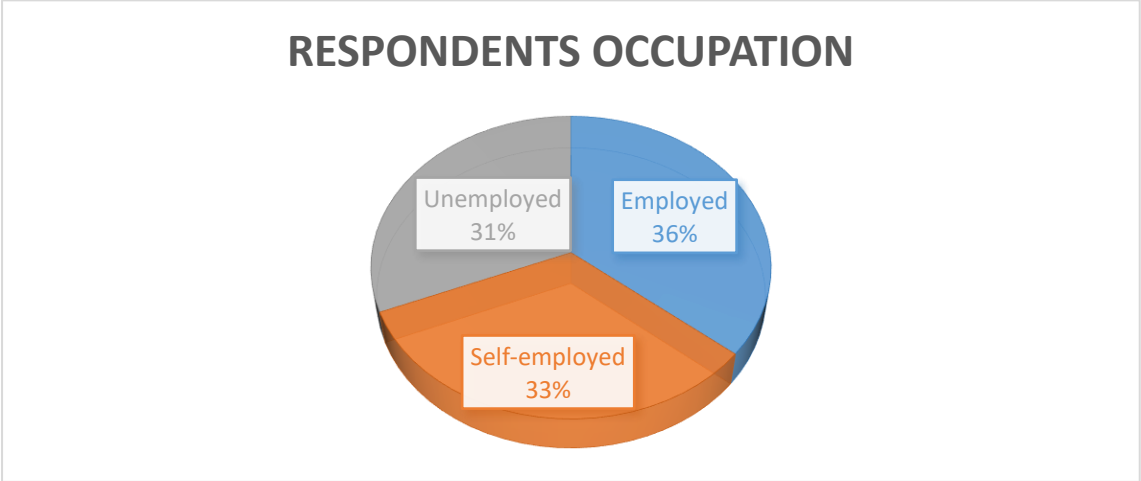

Figure 2: Occupation of respondents

Occupational status is a critical socio-economic determinant in the context of substance relapse. As shown in Figure 2, among respondents, 35.9% were employed, 32.8% were self-employed, and 31.3% were unemployed. The high unemployment rate is concerning, particularly given that economic instability and joblessness have been empirically linked to relapse (Birgen, 2013). Furthermore, Alexander et al. (2011) observed that individuals in occupations with high alcohol exposure—such as bar attendants—face an elevated risk of relapse despite being employed. From a theoretical standpoint, this finding supports strain theory (Merton), which suggests that societal structures that restrict access to legitimate means of achieving goals may push individuals toward deviant behaviors such as drug abuse. In a similar vein, behavioral

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economic theory argues that limited access to positive reinforcers (such as meaningful employment or income stability) increases the attractiveness of immediate, albeit harmful, rewards, such as drug use.

The age distribution of the participants reveals that relapse in drug and substance abuse spans across all age groups. The highest proportion of respondents (24%) was individuals aged 36–45 years, followed by those aged 26–35 (21%) and under 25 (19%). This pattern aligns with existing literature indicating that younger and middle-aged adults are particularly susceptible to relapse due to heightened exposure to stressors, peer influence, and weaker coping mechanisms, as highlighted by SAMHSA (2016) and Hames (2018). According to Arnett's Theory of Emerging Adulthood and the biopsychosocial model, individuals in their youth and early middle age often lack the psychosocial stability and support structures necessary to maintain long-term abstinence, making them vulnerable to relapse. Conversely, although older adults (46 years and above) are traditionally viewed as having lower relapse rates, this study found that they still represent a significant share (35%) of those relapsing—suggesting that chronic life stress, health decline, and social isolation may also influence relapse in later life, consistent with findings from Wesson (2019). These results underscore the importance of tailoring intervention strategies to different age groups, recognizing that age-specific developmental, social, and psychological challenges shape relapse risks.

4.1.2 Respondents' Educational Level

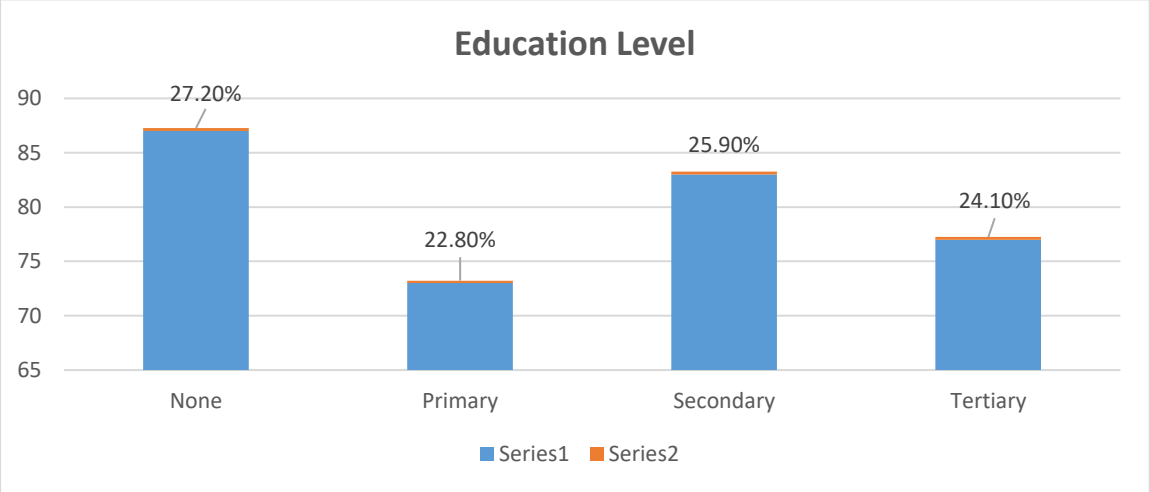

Figure 3: Education Level of respondents

As shown in Figure 3, participants' educational levels were relatively evenly distributed. The study found that 27.2% had no formal education, 22.8% had primary education, 25.9% had secondary education, and 24.1% had tertiary education. A notable finding is that more than half of the participants (50%) had either no education or only primary-level education. This relatively low level of educational attainment is consistent with the existing literature, which links poor academic achievement with a higher susceptibility to relapse. Blum et al. (2014), in a study conducted in Miami, found a strong association between lower levels of education and an increased risk of relapse, a finding corroborated by Sharma and Suneet (2012) in the Indian context.

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From a theoretical lens, this aligns with the Health Belief Model, which posits that individuals with limited health literacy may fail to fully comprehend the risks associated with substance use or the importance of treatment adherence. Similarly, social cognitive theory emphasizes the role of self-efficacy and cognitive capacity in resisting temptation and sustaining behavioral change. Lower educational attainment may therefore impair one's ability to access, process, and act on health information, thereby increasing the risk of relapse. The findings underscore the need for targeted health education interventions that are accessible to individuals with limited formal education.

4.1.3 Marital Status of Respondents

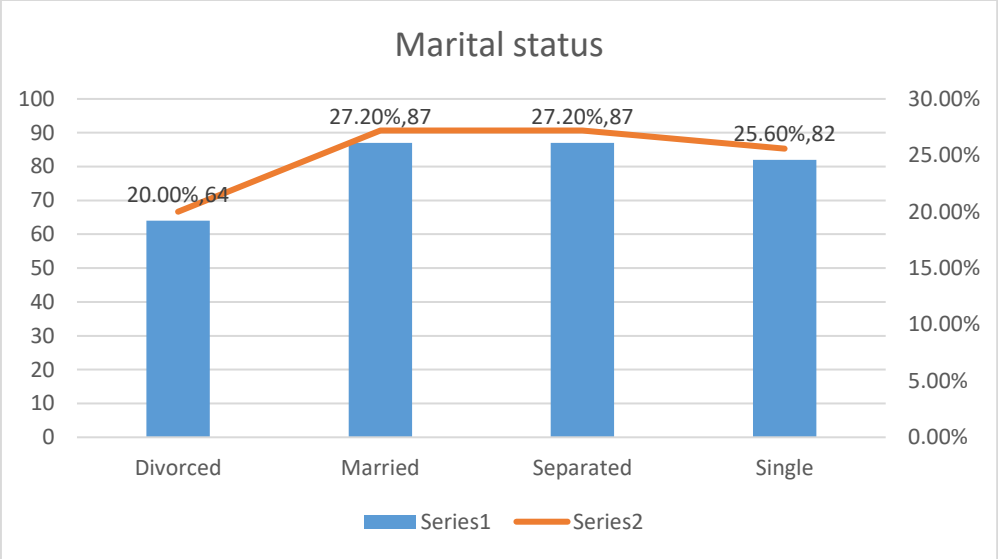

Figure 4: Marital Status

As illustrated in Figure 4, the marital status data reveal that only 27.2% of participants were married, while the majority were separated (27.2%), single (25.6%), or divorced (20%). This means that more than 70% of participants lacked stable spousal or familial support systems, which are often critical during the recovery journey. The research outcome corroborates the findings of Farkhondeh et al. (2015) and Moos et al. (2014) that marriage can act as a significant protective factor against relapse. Married individuals tend to have better emotional support, accountability, and social stability, which collectively contribute to sustained remission.

These findings are particularly relevant within the framework of attachment theory, which emphasizes the importance of stable interpersonal relationships in emotional regulation and resilience. The absence of such relationships, especially among separated or divorced individuals, may expose them to emotional instability, loneliness, and a lack of structure—all of which are conducive to relapse.

4.1.4 Occupation and Education Level of Respondents

The cross-tabulation between occupation and education level among the 320 respondents reveals important patterns in the socio-economic context of relapse. The result is presented in Table 1.

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Table 1: Occupation and Education of Respondents

Occupation	None	Primary	Secondary	Tertiary	Total
Employed (n=115)	32 (27.8%)	27 (23.5%)	32 (27.8%)	24 (20.9%)	115
Self-employed (n=105)	29 (27.6%)	27 (25.7%)	30 (28.6%)	19 (18.1%)	105
Unemployed (n=100)	17 (17.0%)	22 (22.0%)	27 (27.0%)	34 (34.0%)	100
Total	78	76	89	77	320

The results displayed in Table 1 reveal that among the employed respondents (n = 115), the distribution of education levels was fairly balanced, with secondary education being the most common (n = 32; 27.8%), followed by those with no education (n = 32; 27.8%), primary education (n = 27; 23.5%), and tertiary education (n = 24; 20.9%). A similar trend was observed among the self-employed group (n = 105), where most had secondary education (n = 30; 28.6%), followed closely by those with no education (n = 29; 27.6%) and primary education (n = 27; 25.7%). Interestingly, among the unemployed respondents (n = 100), the largest subgroup had a tertiary education (n = 34; 34.0%). The Pearson Chi-square test result χ^2 (6) = 8.647, p = 0.194, indicated no statistically significant association between the two variables. The likelihood ratio test also yielded a non-significant result (p = 0.209), confirming that variations in education level are not strongly associated with differences in occupational status within this sample.

The outcome suggests that higher education did not necessarily guarantee employment among the study participants. Suggesting that even higher educational attainment does not necessarily protect against unemployment in the context of substance use recovery. This may reflect barriers such as stigma, skill erosion during substance abuse periods, or a mismatch between qualifications and job availability. These findings are consistent with earlier literature suggesting that while low education is a predictor of relapse (Blum et al., 2014), educational attainment alone does not guarantee economic reintegration.

4.2 Association between Socio-Demographic factors and relapse in drug and substance

The study sought to determine the association between Socio-Demographic factors and relapse in drug and substance use. Results are shown in Table 2.

Table 2: Association between Socio-Demographic factors and relapse in drug and substance

	df	chi square ((χ2)	p value
Gender	1	8.999	0.035
Age	3	9.909	0.011

A Chi-square test with a 1 degree of freedom resulted in a Pearson Chi-squared statistic of 8.999, and a p-value of 0.035 (χ2 = 8.999 and P = 0.035). This indicates that there was a significant relationship between gender and relapse in drug and substance abuse among patients

attending the MAT clinic in Karuri ward, Kiambu County, Kenya. Devout et al. (2019) contend that Men are often more prone to risk-taking behavior and may face severe withdrawal symptoms during cessation, while women may be disproportionately burdened by stigma, social isolation, and lack of partner support, all of which serve as relapse triggers.

In addition, the chi-square test with 3 degrees of freedom resulted in a Pearson Chi-squared statistic of 8.022, and a p-value of 0.011 ($\chi 2 = 9.909$ and $P = 0.011$). This indicates that there was a significant relationship between age and relapse in drug and substance abuse among patients attending the MAT clinic in Karuri ward, Kiambu County, Kenya. Carson *et al*. (2018) found that older patients have a lower relapse rate as compared to young patients. The study attributed the difference to other age-related factors that positively impact abstinence after treatment, such as higher self-efficacy, greater motivation, and stronger social networks among adults.

4.3 Binary Logistic Regression

This section presents the results of the binary logistic regression used to identify the key demographic factors influencing relapse among patients attending the Medication-Assisted Therapy (MAT) clinic at Karuri Level 4 Hospital, Kiambu County. The dependent variable, relapse (1 = Yes, 0 = No), was modeled against predictors including age, gender, and education level. The Results are presented in Table 3.

Table 3: Binary Logistic Regression

Predictor	B	S.E.	Wald	df	Sig.	Exp(B) (OR)	95% CI for OR
Age	-0.05	0.02	6.25	1	0.01	0.95	0.91–0.99
Gender (Male)	0.75	0.3	6.25	1	0.01	2.12	1.19–3.78
Education Level	-0.3	0.12	6.25	1	0.01	0.74	0.58–0.94
Constant	-2.5	0.75	11.1	1	0	-	-

The results in Table 3 show that the odds of relapse decreased by 5% for each additional year of age (OR = 0.95, p = 0.012), indicating that younger patients are more likely to relapse than older patients. Equally, Gender had a notable effect, with males having more than twice the odds of relapse compared to females (OR = 2.12, p = 0.012). Additionally, education level was protective, with higher education levels associated with a 26% reduction in the odds of relapse (OR = 0.74, p = 0.012), demonstrating the stabilizing effect of education on recovery.

5. Conclusion

Based on the findings, the study concludes that relapse among patients attending the MAT clinic at Karuri Level 4 Hospital is shaped by demographic attributes, including age, marital status, and education, that exhibited varying associations with relapse, highlighting the importance of tailoring interventions to specific population subgroups.

6. Recommendations

The study recommends that MAT clinics in Karuri Ward adopt age- and gender-responsive treatment approaches, as younger patients and specific gender groups were found to be more vulnerable to relapse. Tailored counseling, mentorship, and relapse prevention strategies

should be designed to address the unique needs and coping challenges associated with different age groups and genders.

The study further recommends integrating socio-economic support mechanisms into recovery programs, particularly for clients with low educational attainment and unstable employment. Linking patients to vocational training, adult education, and income-generating opportunities would enhance economic stability and reduce the risk of relapse.

Finally, MAT clinics should strengthen social support interventions, especially for patients who are single or lack stable family support. Incorporating demographic risk profiling during intake would enable early identification of high-risk groups and facilitate targeted follow-up and support to improve long-term recovery outcomes.

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