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~ SPECIAL REPORT ~

## Sexuality and Gender

Findings from the Biological,  
Psychological, and Social Sciences

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## Executive Summary

This report presents a careful summary and an up-to-date explanation of research—from the biological, psychological, and social sciences—related to sexual orientation and gender identity. It is offered in the hope that such an exposition can contribute to our capacity as physicians, scientists, and citizens to address health issues faced by LGBT populations within our society.

Some key findings:

### **Part One: Sexual Orientation**

- The understanding of sexual orientation as an innate, biologically fixed property of human beings—the idea that people are “born that way”—is not supported by scientific evidence.
- While there is evidence that biological factors such as genes and hormones are associated with sexual behaviors and attractions, there are no compelling causal biological explanations for human sexual orientation. While minor differences in the brain structures and brain activity between homosexual and heterosexual individuals have been identified by researchers, such neurobiological findings do not demonstrate whether these differences are innate or are the result of environmental and psychological factors.
- Longitudinal studies of adolescents suggest that sexual orientation may be quite fluid over the life course for some people, with one study estimating that as many as 80% of male adolescents who report same-sex attractions no longer do so as adults (although the extent to which this figure reflects actual changes in same-sex attractions and not just artifacts of the survey process has been contested by some researchers).
- Compared to heterosexuals, non-heterosexuals are about two to three times as likely to have experienced childhood sexual abuse.

## **Part Two: Sexuality, Mental Health Outcomes, and Social Stress**

- Compared to the general population, non-heterosexual sub-populations are at an elevated risk for a variety of adverse health and mental health outcomes.
- Members of the non-heterosexual population are estimated to have about 1.5 times higher risk of experiencing anxiety disorders than members of the heterosexual population, as well as roughly double the risk of depression, 1.5 times the risk of substance abuse, and nearly 2.5 times the risk of suicide.
- Members of the transgender population are also at higher risk of a variety of mental health problems compared to members of the non-transgender population. Especially alarmingly, the rate of lifetime suicide attempts across all ages of transgender individuals is estimated at 41%, compared to under 5% in the overall U.S. population.
- There is evidence, albeit limited, that social stressors such as discrimination and stigma contribute to the elevated risk of poor mental health outcomes for non-heterosexual and transgender populations. More high-quality longitudinal studies are necessary for the “social stress model” to be a useful tool for understanding public health concerns.

## **Part Three: Gender Identity**

- The hypothesis that gender identity is an innate, fixed property of human beings that is independent of biological sex—that a person might be “a man trapped in a woman’s body” or “a woman trapped in a man’s body”—is not supported by scientific evidence.
- According to a recent estimate, about 0.6% of U.S. adults identify as a gender that does not correspond to their biological sex.
- Studies comparing the brain structures of transgender and non-transgender individuals have demonstrated weak correlations between brain structure and cross-gender identification. These correlations do not provide any evidence for a neurobiological basis for cross-gender identification.

- Compared to the general population, adults who have undergone sex-reassignment surgery continue to have a higher risk of experiencing poor mental health outcomes. One study found that, compared to controls, sex-reassigned individuals were about 5 times more likely to attempt suicide and about 19 times more likely to die by suicide.
- Children are a special case when addressing transgender issues. Only a minority of children who experience cross-gender identification will continue to do so into adolescence or adulthood.
- There is little scientific evidence for the therapeutic value of interventions that delay puberty or modify the secondary sex characteristics of adolescents, although some children may have improved psychological well-being if they are encouraged and supported in their cross-gender identification. There is no evidence that all children who express gender-atypical thoughts or behavior should be encouraged to become transgender.

## Conclusion

Accurate, replicable scientific research results can and do influence our personal decisions and self-understanding, and can contribute to the public discourse, including cultural and political debates. When the research touches on controversial themes, it is particularly important to be clear about precisely what science has and has not shown. For complex, complicated questions concerning the nature of human sexuality, there exists at best provisional scientific consensus; much remains unknown, as sexuality is an immensely complex part of human life that defies our attempts at defining all its aspects and studying them with precision.

For questions that are easier to study empirically, however, such as those concerning the rates of mental health outcomes for identifiable subpopulations of sexual minorities, the research does offer some clear answers: these subpopulations show higher rates of depression, anxiety, substance abuse, and suicide compared to the general population. One hypothesis, the social stress model—which posits that stigma, prejudice, and discrimination are the primary causes of higher rates of poor mental health outcomes for these subpopulations—is frequently cited as a way to explain this disparity. While non-heterosexual and transgender individuals are often subject to social stressors and discrimination, science has not shown that these factors alone account for the entirety, or even a majority, of the health disparity between non-heterosexual and transgender subpopulations and the general population. There is a need for extensive research in this area to test the social stress hypothesis and other potential explanations for the health disparities, and to help identify ways of addressing the health concerns present in these subpopulations.

Some of the most widely held views about sexual orientation, such as the “born that way” hypothesis, simply are not supported by science. The literature in this area does describe a small ensemble of biological differences between non-heterosexuals and heterosexuals, but those biological differences are not sufficient to predict sexual orientation, the ultimate test of any scientific finding. The strongest statement that science offers to explain sexual orientation is that some biological factors appear, to an unknown extent, to predispose some individuals to a non-heterosexual orientation.

The suggestion that we are “born that way” is more complex in the case of gender identity. In one sense, the evidence that we are born with

a given gender seems well supported by direct observation: males overwhelmingly identify as men and females as women. The fact that children are (with a few exceptions of intersex individuals) born either biologically male or female is beyond debate. The biological sexes play complementary roles in reproduction, and there are a number of population-level average physiological and psychological differences between the sexes. However, while biological sex is an innate feature of human beings, gender identity is a more elusive concept.

In reviewing the scientific literature, we find that almost nothing is well understood when we seek biological explanations for what causes some individuals to state that their gender does not match their biological sex. The findings that do exist often have sample-selection problems, and they lack longitudinal perspective and explanatory power. Better research is needed, both to identify ways by which we can help to lower the rates of poor mental health outcomes and to make possible more informed discussion about some of the nuances present in this field.

Yet despite the scientific uncertainty, drastic interventions are prescribed and delivered to patients identifying, or identified, as transgender. This is especially troubling when the patients receiving these interventions are children. We read popular reports about plans for medical and surgical interventions for many prepubescent children, some as young as six, and other therapeutic approaches undertaken for children as young as two. We suggest that no one can determine the gender identity of a two-year-old. We have reservations about how well scientists understand what it even means for a child to have a developed sense of his or her gender, but notwithstanding that issue, we are deeply alarmed that these therapies, treatments, and surgeries seem disproportionate to the severity of the distress being experienced by these young people, and are at any rate premature since the majority of children who identify as the gender opposite their biological sex will not continue to do so as adults. Moreover, there is a lack of reliable studies on the long-term effects of these interventions. We strongly urge caution in this regard.

We have sought in this report to present a complex body of research in a way that will be intelligible to a wide audience of both experts and lay readers alike. Everyone—scientists and physicians, parents and teachers, lawmakers and activists—deserves access to accurate information about sexual orientation and gender identity. While there is much controversy surrounding how our society treats its LGBT members, no political

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or cultural views should discourage us from understanding the related clinical and public health issues and helping people suffering from mental health problems that may be connected to their sexuality.

Our work suggests some avenues for future research in the biological, psychological, and social sciences. More research is needed to uncover the causes of the increased rates of mental health problems in the LGBT subpopulations. The social stress model that dominates research on this issue requires improvement, and most likely needs to be supplemented by other hypotheses. Additionally, the ways in which sexual desires develop and change across one's lifespan remain, for the most part, inadequately understood. Empirical research may help us to better understand relationships, sexual health, and mental health.

Critiquing and challenging both parts of the “born that way” paradigm—both the notion that sexual orientation is biologically determined and fixed, and the related notion that there is a fixed gender independent of biological sex—enables us to ask important questions about sexuality, sexual behaviors, gender, and individual and social goods in a different light. Some of these questions lie outside the scope of this work, but those that we have examined suggest that there is a great chasm between much of the public discourse and what science has shown.

Thoughtful scientific research and careful, circumspect interpretation of its results can advance our understanding of sexual orientation and gender identity. There is still much work to be done and many unanswered questions. We have attempted to synthesize and describe a complex body of scientific research related to some of these themes. We hope that this report contributes to the ongoing public conversation regarding human sexuality and identity. We anticipate that this report may elicit spirited responses, and we welcome them.