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Hubris, Humility and
The Humongous Lessons of The Brain

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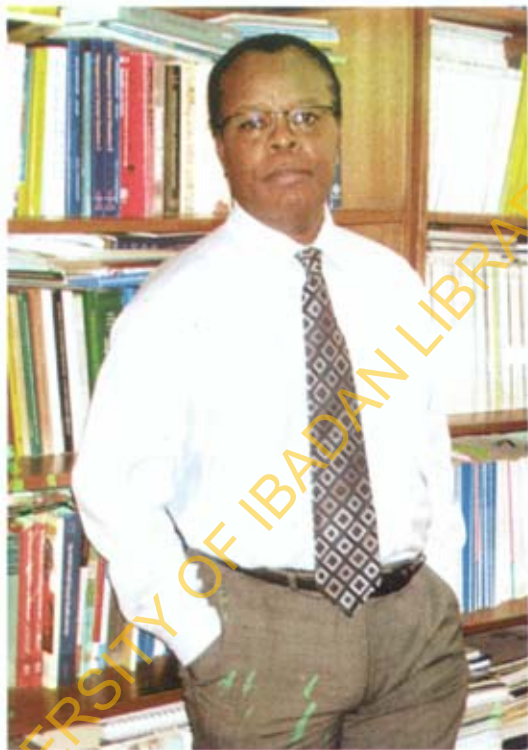
by
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**HUBRIS, HUMILITY AND
THE HUMONGOUS LESSONS OF THE BRAIN**

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I am fascinated by the brain. That may not be a surprise. Indeed, you might ask, why else would any sane person choose to be a psychiatrist? That is, if you are generous enough not to conclude that, in fact, only *insane* people specialize in psychiatry! We will come to that later.

For now, let us start with an example of hubris. Let us reflect on what others have said about the brain of Africans.

Alien psychiatrists working in Africa during the colonial period had difficulties identifying some mental health conditions among Africans largely as a result of language and cultural barriers. But due to the ways colonizers chose to see the colonized, these alien specialists typically interpreted their inability to diagnose mental illness in the African as a sign that the brain of Africans was poorly developed.

Carothers(1), for example, had this to say about Africans:

"The inherent mode of thought of the African can be explained on the assumption that phantastic (sic) thinking plays a larger part in it, and this is characteristic of day-dreams, dreams and myths, is especially marked in children and is essentially an immature mode of thought. It is unproductive and uncritical..."

In another context, he claimed that the African did not suffer from obsessions because of a *"poorly developed frontal lobe..."*. The frontal lobe is the part of the brain that helps us to perform higher

executive functions such as planning and reasoning (2); it is the part of the brain which most differentiates humans from animals. Carothers was not the only person to give their opinion about the workings of the brains of Africans. Here is what Westermann was quoted to have said:

"The African thinking is ...dependent on excitement, on external influences and stimuli, is a characteristic sign of primitive mentality...Where the stimulus of emotion is lacking, the (African) shows little spontaneity and is passive...Has few gifts for work which aims at distant goals and requires tenacity, independence, and foresight" (1).

He was also quoted to have suggested that depression and the symptom of guilt were rare in Africans because of their "lack of responsibility" (1).

Basically, what these psychiatrists were saying was that the brain of the African adult was no more developed than that of a child, that Africans lacked the ability to plan for the future, and that they lived an uncritical happy-go-lucky life. The notion of the "happy savage" was in fact a common description given to the African by these colonial specialists.

Some years later, Alex Leighton, Thomas Adeoye Lambo and their colleagues showed that these claims were false, reflecting the hubris of the colonialists. In their pioneering comparative study of

the Yoruba and Stirling County samples they reported that:

"..the patterning and types of psychiatric disorder among the Yoruba turned out to be qualitatively much like the disorders with which we in North America and Europe are familiar" (3).

The work of Lambo and his colleagues was very influential. In essence, it was saying: *we are as normal as you are since we have a tendency to be as abnormal as you are.* They used the power of comparative cross-national epidemiology to challenge the notion that the brain of Africans was fundamentally different from that of people in North America or Western Europe.

More and larger cross-national epidemiological studies have since revealed the degree to which human beings are similar. They have also shown the many ways in which the functioning of the brain in health and in illness is very much dependent on the environment in which people live. Much like physical disorders, such as hypertension or diabetes, mental disorders are universal but shaped by the social milieu in which they occur. Indeed, as we shall see much later in this lecture, not only are mental disorders much like physical disorders, you really cannot talk of one without the other.

Studies in primary care or general health care settings across the world show that a large proportion of those seeking care for a variety of health complaints will have mental health problems.

The largest study of this sort, Psychological Problems in General Health Care (PPGHC), conducted in 14 countries across the world, including Nigeria, shows that, on average, about 15% of those presenting to these facilities will have one mental health condition or the other (4). The commonest of such conditions will be various forms of anxiety disorder, depression, alcohol use problems and sleep disorders. Across much of the world, the association of these disorders with gender also tends to be relatively similar. Thus, anxiety and depressive disorders are commoner among females while substance use disorders are more prevalent in males.

The PPGHC also helped to challenge the myth, again originally canvassed by alien psychiatrists working in Africa (5). This myth, which is still somewhat alive till this day, and now repeated like a dogma even by psychiatrists in developing countries, is that African patients are often lacking in the required psychological sophistication to express their distress in the form of clear psychological symptoms and that these patients are therefore more likely to express such distress in the form of bodily symptoms. The use of bodily symptoms as an idiom of psychological distress, otherwise known as somatization, has therefore been commonly regarded as being more typical of African patients than, say, their counterparts in Western Europe. The findings confirmed what others had reported in previous studies: the expression of bodily symptoms by persons with

psychological distress is a common and universal phenomenon (6). Of course, prevalence varied across different sites of the study. However, there was no pattern consistent with the notion that the phenomenon was either more or less common in developing countries and certainly not so in Nigeria, the only African country in the study. On the other hand, what this study showed, perhaps for the first time, was that somatization was not racially determined, it was not a manifestation of racial or regional culture but of the "culture" of patient-clinician interaction (7).

We will talk later about the very important issue of the relationship between mental and physical health conditions. For now, let us continue with the focus on how disorders of the human brain manifest across racial and cultural boundaries.

WHAT COMMUNITY-BASED STUDIES HAVE TAUGHT US ABOUT THE BRAIN

Large-scale epidemiological studies have sought to provide answers to questions relating to the occurrence, course, phenomenology, risk factors, consequences and outcome of mental disorder in diverse populations. They have been used to address the important question of whether these disorders vary in their occurrence or outcome in different groups of people, be it based on race, nationality or culture. Ibadan can rightly be proud of having been a part of some of the most influential cross-national comparative studies in the field of mental health. Other than the

study of mental disorders among the Yoruba by Leighton, Lambo and their colleagues which sought to compare the pattern of mental illness among the Yoruba with that of residents of Stirling County in Canada, and to which I have earlier made reference, there are a number of other major studies of which Ibadan has been a part and the results of which have shaped some of our current thinking about mental disorders.

The International Pilot Study of Schizophrenia, conducted in the early 60's and the 10-country study on Determinants of Outcome of Severe Mental Disorders (DOSMeD) conducted about a decade later have remained influential in showing that not only does schizophrenia occur across diverse cultural groups, the disorder shows a remarkable consistency in some of its core features across cultures (8, 9). One of the findings of the studies, suggesting that schizophrenia might have a better outcome in developing compared to developed countries, has remained a sort of Holy Grail of psychiatric epidemiology. This finding, about which we have expressed some doubt (10), is one of the interesting puzzles about the workings of the brain. For how else can one explain the possibility that an illness which often has a very devastating impact on the lives of its sufferers will have a better outcome in settings where access to and the quality of available treatment are commonly inadequate than in settings with more and better resources. Anyway, this paradox, which is yet to be disproved empirically, is one area of our own current cross-cultural studies.

The Indianapolis-Ibadan Dementia Project, funded consecutively for 20 years by the US National Institute of Ageing, was designed to compare the epidemiology of dementia, especially Alzheimer's dementia, among elderly Yoruba and African-Americans living in Indianapolis. Initiated by Professors Kayode Osuntokun and Hugh Hendrie, the project was informed by the clinical observation that, while dementia was becoming a major public health issue in North America and Western Europe, very rarely were cases seen in our health care facilities in Nigeria. The question was: could it be that dementia was less common among Nigerians than in Western countries and, if so, what could be the reason for this? If differential rates of occurrence could be established and clear evidence of differences in exposure to some risk factors could be demonstrated, perhaps it would be possible to have an insight to at least some of the possible causative features of the disorder. And if these turned out to be modifiable environmental or lifestyle factors, an observation of potential public health importance would have been made.

The main finding of the studies was that Alzheimer's disease is in fact significantly less likely to occur in Nigerians compared to African Americans living in Indianapolis (11). One critical question was whether this was because Nigerian elderly persons with dementia were dying earlier than their counterparts in the US as this could account for differences in the number of cases of the

disease. Because of the longitudinal design of the study, permitting for the identification of both prevalent and incident cases over a period of time, we were able to show that the reduced occurrence of dementia in Nigerians was not because of higher mortality in Nigerian elderly (12). So, even though mortality was higher among the Nigerian cohort (13), it did not explain the lower occurrence of dementia among them compared to African Americans.

The search for the possible causes of dementia has been a central theme of the Indianapolis-Ibadan Project. The findings of these aspects of the study have shown the importance of situating the findings of epidemiological studies within the constraints of the size and representativeness of the samples studied. While we initially reported that a commonly reported risk factor for Alzheimer's disease, the possession of apolipoprotein (APOE) 4, did not have such import in our sample (14, 15), with larger accumulation of cases over the years, we have now found that APOE is also a risk factor for the disease in Nigerians (16). In a similar context, we have also examined the association of other putative risk factors such as the level of the amino acid homocysteine, high levels of which have been reported to be a risk factor for dementia. The result, even though inconclusive, suggests that this amino acid constitutes a similar level of risk for dementia for both Nigerians and African Americans.

The finding that dementia is less common in Nigerians compared to what has been reported from various parts of the world has since been confirmed in the largest study of ageing to be conducted in Africa. The Ibadan Study of Ageing was a cohort study conducted among a representative epidemiological sample of Yoruba-speaking elderly persons aged 65 years and above and residing in the south-western and north-central parts of the country. A cohort of over 2000 elderly persons was studied over a period of more than five years. The participants were assessed for mental, physical and social well-being as well as for living circumstances, lifestyles and habits.

The study found that dementia occurred at a much lower rate in Nigerians than has been reported from North America and Western Europe (17). Even though the rates obtained from this much larger study of the elderly was higher than we had reported in the Indianapolis-Ibadan Dementia Project, it was still considerably lower than rates found among African Americans and certainly lower than rates found in other racial groups in North America and Western Europe. A systematic review of the global picture has provided support for lower rates of the disorder in sub-Saharan Africa: it reports age-standardized prevalence estimates in the range of 5% to 8% among people aged 60 years and over across all world regions except for sub-Saharan Africa where the estimates were in the range of 2% to 4%(18).

The notion of "use it or lose it" came from observations that, to some extent, continued mental activities into old age seems to protect against the early onset of dementia. Such activities may include clearly academic or intellectual pursuits or related to social stimulation in the form of social interaction and engagement. Findings from the Ibadan Study of Ageing have supported these observations. In that study, elderly respondents who were free of cognitive impairment at baseline but had reduced social engagement through participation in family and community activities were at elevated risk to develop new onset of dementia three years later (17).

Alzheimer's dementia remains a serious and debilitating disorder for which we currently have no effective treatment. What we do have are measures to delay its progression and to ameliorate some of the manifestations of the disorder and provide some relief for caregivers (19). It is in this context that any understanding of risk factors for the disorder or premonitory signs of its occurrence can be extremely useful for any possible preventive measures.

Among those premonitory signs is the curious observation that persons who are at elevated risk to develop dementia may have impaired motor (or movement) ability many years before the emergence of the first signs of dementia. Several reports based on prospective longitudinal studies conducted in Western Europe and North America have suggested that slower gait speed among

older persons who show no evidence of cognitive impairment at baseline significantly predicts future occurrence of such impairment(20, 21). Indeed, because changes in gait speed precede the onset of cognitive impairment by many years, they have been proposed as an early and sensitive marker of cognitive impairment in the elderly.

Similar observations have been made in the Jbadan Study of Ageing. About 71.0% of the 1461 participants who were free of dementia at baseline assessment and who had their gait speed measured were successfully followed up in two waves over two years (22). Along with increasing age, poor health and lower economic status, a slower baseline gait speed was independently associated with poorer cognition at follow-up (1.23, 95% C.I.= 0.48-2.0). Also, elderly person who had a greater change in their gait between the two assessment periods had the worst follow-up cognition.

Gait mechanics involve the interplay of many cognitive and motor functions, and their integration requires an intact executive functioning (23). These functions are known to decline with ageing, even in the presence of an optimal general health and intact global cognitive functioning (24). There have also been suggestions that gait speed dysfunction is associated with underlying neurofibrillar tangles and other markers of cognitive disorders in the frontal lobes and basal ganglia (25-27).

So, as far as we can tell, the brains of the elderly Nigerian, in so far as factors that may predispose to the development of dementia are concerned, are no different from those of populations of elderly persons elsewhere. Their brains require stimulation to protect them from the scourge of dementia and are also liable to show features that may indicate vulnerability to the disorder. Why the occurrence of dementia may be less among them compared to populations in Europe and elsewhere is at the moment unclear. However, while the Nigerian elderly may be relatively at less risk to develop dementia, they seem to be at elevated risk to develop another disabling disorder. Depression is a serious and recurrent disorder. It ranks between 1st and 3rd among all causes of years lost to disability in every part of the world, including in sub-Saharan Africa (28-30).

It would appear that while depression among the general adults in Nigeria may be common and equally disabling as in other parts of the world (31), its occurrence in the elderly may be far beyond what has been reported for elderly populations in other parts of the world. In the Ibadan Study of Ageing, about 1 in 4 elderly persons reported having experienced major depressive disorder in their lifetime while about 1 in 12 had either experienced it in the previous 12 months or were currently doing so at the time of assessment (32).

The longitudinal design of the Ibadan Study of Ageing provided an opportunity not only to assess the prevalence of depression but

also to determine its incidence. And the results of the incident analysis were revealing (33). Confirming the high rate of depression in this population, we found that 1 in 10 elderly persons will develop major depression in any 12-month period. The risk factors for depression were also assessed. Among females, but not males, those residing in rural areas or lacking in supportive social network were more likely to develop depression.

Why elderly Nigerians are at such a high risk for depression is not entirely clear. However, the attenuation of traditional social support is clearly a major risk, particularly for women. Whatever are the causes and as others have found (34), the condition is associated with considerable disability, much more so than many chronic conditions commonly found among the elderly (see Table 1)(35).

Table 1: Disorder comparisons of global Sheehan Disability Scale ratings in the Ibadan Study of Ageing

Condition	Male		Female		Total		Depression versus physical condition*	
	%	(se)	%	(se)	%	(se)	z	p-value
Depression	14.5	(2.5)	12.5	(1.7)	13.3	(1.4)	-	-
Arthritis	9.9	(0.6)	11.9	(0.7)	10.9	(0.5)	-27.50	.001
Back or neck pain	11.8	(1.2)	9.8	(0.9)	10.7	(0.7)	-14.80	.001
High blood pressure	11.5	(2.5)	6.9	(2.4)	9.5	(1.8)	-7.14	.01
Asthma	9.6	(2.6)	8.6	(2.1)	8.9	(1.7)	-6.00	.01
Diabetes mellitus	2.7	2.7	6.0	4.1	4.9	2.8	-3.74	.01

*Analysis controlled for age and sex. Gureje et al. JAGS 2008; 56: 2033 - 2038

We have learnt a great deal more about the workings of the brain through large-scale epidemiological studies conducted in diverse cultural settings. The World Mental Health surveys are community-based epidemiological studies about the prevalence, antecedents and correlates of a wide range of mental disorders (36). Now, either concluded or being conducted in over 25 countries, these studies are unique in regard to the uniform methodology employed across the participating countries. The samples are representative of the populations in which they were drawn and, for each country, they are large enough to permit for stable estimates of the more common disorders. The use of similar ascertainment procedures provides an important opportunity for cross-national comparisons as well as for drawing inferences about the differential impact of environmental factors.

THE BURDEN OF MENTAL DISORDERS

We now know that between 25% and 40% of adults will experience a mental health condition in their lifetime(36). That is, when cross-sectional studies are conducted and we assess people for the presence or for a previous experience of mental disorder, we get an indication that mental illness will have been experienced by between 1 in 4 or 2 in every 5 adults in the community. However, when we compute how many of them will have a disorder by the time they reach the age of 75, the proportion goes up to between 1 in 3 and 1 in 2 (37). We also know from these studies, that many mental health conditions often have their onset in childhood (37). Indeed, the median age of onset for common mental disorders such as anxiety and depression is

often early adolescence and about 40% of adult cases have their first episode of illness in childhood.

Mental disorders, including the very common ones, are associated with several adverse effects(38). They often lead to premature termination of education (39), marital dysfunction and violence (40, 41), parental dysfunction (42), low household income and poverty (43-45). Impairment of day-to-day functioning is the most common consequence. Indeed, most of the more commonly occurring mental disorders, such as depressive and anxiety disorders, are far more disabling than many of the common chronic physical health conditions, such as arthritis, diabetes or hypertension (see Table 2)(46).

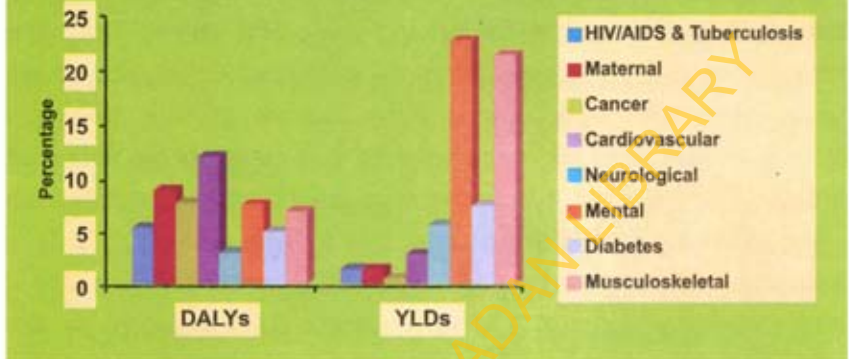
Table 2: Disorder-specific impairment ratings in the WHO World Mental Health Surveys (adapted from Ormel et al. 2008)

Conditions		Proportion rated as severely disabled			
		High-income countries		Low and middle-income countries	
		%	(se)	%	(se)
Physical disorders	Arthritis	23.3	(1.5)	22.8	(3.0)
	Asthma	8.2	(1.4)	26.9	(5.4)
	Cancer	16.6	(3.2)	23.9	(10.3)
	Diabetes	13.6	(3.4)	23.7	(6.1)
	High blood pressure	5.3	(0.9)	23.8	(2.6)
Mental disorders	Bipolar disorder	68.3	(2.6)	52.1	(4.9)
	Depression	65.8	(1.6)	52.0	(1.8)
	Generalized anxiety disorder	56.3	(1.9)	42.0	(4.2)
	Panic disorder	48.4	(2.6)	38.8	(4.7)
	PTSD	54.8	(2.8)	41.2	(7.3)

Mental disorders also increase the risk of premature mortality(47). This is not only through suicide which is of course more often than not preceded by a mental disorder(48), but also through lifestyle issues, cardiovascular events and accidental injuries, including those that may result from substance abuse. For example, depression is a risk factor for cardiovascular mortality due to heart attack and stroke among people with cardiovascular disease (49).

The only quantitative indicator of disease burden that allows us to reflect the total amount of healthy life lost, to all causes, whether from premature mortality or from some degree of disability during a period of ill-health is the Disability Adjusted Life Year. DALY is an index of the time lived with a disability and the time lost due to premature mortality. Using this index, and presenting age-, sex-, year-, country-, and region-specific figures for 291 diseases and injuries as well as for 67 risk factors, the authors of the Global Burden of Disease 2010 reports have shown that mental and substance use disorders were responsible for 7.4% of the global total DALYs in 2010(50). They showed that mental and substance use disorders are the leading disease category of years lost to disability (YLDs), and the 5th leading category of DALYs globally (30). Mental and substance use disorders account for a greater proportion of the global burden than that attributed to HIV/AIDS and tuberculosis or diabetes. The burden due to mental and substance use disorders is also growing due to population growth and ageing. Increase in life expectancy can be expected to lead to more people living with these disorders for longer period of time.

Figure1: Percentage distribution of DALYs and YLDs



The human brain is a complex organ. It is among the most complex biological structures known to man. Reflecting on that complexity, any neuroscientist or discerning student of health science in general must wonder why the occurrence of mental disorder across the lifetime is not even more common than has been found in these studies. It is unfortunate that mental disorders are so grossly misunderstood and mis-represented. It is true that mental disorders are driven by a complex admixture of social, biological and psychological factors and that this complexity often makes the lay public develop simplistic view of these disorders, sometimes seeing mental health conditions in dualistic fashion of either social or biological.

THE RELATIONSHIP BETWEEN THE BRAIN AND THE BODY

It is important to remind ourselves of some important facts about disorders of the brain. Mental disorders are not social constructs for which there are no underlying biological roots. They are manifestations of impaired functioning of specific regions of the brain. We don't know the precise nature of the biological underpinnings of all mental disorders, but we do know these for many. For example, we know from neuroimaging studies the parts of the brain that are responsible for fear and anxiety (51), episodic memory, working memory (52), emotional regulation, and reward seeking (53), and we know how these parts are affected in disorders such as schizophrenia and depression (54). We know that depression is associated with dysfunction in specific brain areas that are involved in emotional regulation, impulse control and affective responding. Specifically, there is evidence linking depression with abnormal hypoactivation of lateral prefrontal cortices (55, 56). In depression, as in several other disorders, social factors do play a role both in the onset and course of the disorder (56). For example, loneliness is known to increase susceptibility to depression as well as to many other mental disorders (57). Perceived loneliness is indeed a chronic social stressor (58, 59). But the link between loneliness and mental disorder is the malfunctioning of specific parts of the brain. We shall talk a little bit more about this later.

An interesting dimension to the working of the brain is its control or association with the other organs of the body. We all know that our

every movement and action, both willful and unplanned, is controlled by the brain. What is not often clear to most of us is the intricate link between the body and mind, or the manifestations of brain activities, in both physical and mental health conditions. This relationship is complex and dynamic such that the body influences the brain as much as the brain influences the body. I have been very interested in learning and studying this relationship for quite a while (60, 61). The notion of somatization, to which I have previously alluded during this lecture, the phenomenon by which we understand bodily complaints and signs to be directly attributable to emotional conditions, is a good example of this relationship. Thus, when individuals have nagging bodily symptoms, ranging from various forms of burdensome sensations to fatigue and to pain, and we are unable to find any evidence that such complaints or experiences are due to a specific dysfunction in a bodily organ, we may find that the underlying perturbations are not in the body but in the brain(62-64).

But the relationship between body and mind goes beyond the bodily expression of psychological distress. There is a strong body of evidence showing that mental and physical conditions tend to occur together (60). The presence of physical disorders increases the likelihood of a co-occurring mental disorder. This is true for a range of common non-communicable diseases such as pain, asthma, diabetes, arthritis, and hypertension (35, 61, 65-68) (see Table 3 for example from the Ibadan Study of Ageing). The relationship is also true for communicable diseases.

For example, there is an elevated risk of mental illness among persons with HIV infection (69). The reverse of this relationship is also true: the presence of mental disorders commonly increases the likelihood of a comorbid physical disorder(70). For example, there is an increased likelihood of diabetes among patients with schizophrenia than in the general population (71). While the prevalence of diabetes in the general adult population may be between 2-3%, it is often as high as 15% among patients with schizophrenia. The elevated risk is not entirely due to the use of the newer anti-psychotic medications, some of which are known to predispose to a number of metabolic disorders, including diabetes (72).

Table 3: Comorbidity of depression and chronic physical conditions in the Ibadan Study of Ageing

Condition	Respondents	Prevalence of depression	Odds Ratio (95% CI) of having depression
	N	% (95% CI)	% (95% CI)
Arthritis+	1488	7.9 (6.6-9.4)	1.9 (1.1-2.3)
Arthritis-	664	5.1 (3.7-7.1)	1
Back or neck pain+	1088	8.5 (6.9-10.3)	1.6 (1.1-2.2)
Back or neck pain-	1064	5.6 (4.3-7.1)	1
High blood pressure+	216	12.0 (8.3-17.1)	2.0 (1.3-3.2)
High blood pressure-	1881	6.3 (5.3-7.5)	1
Asthma+	159	11.3 (7.3-17.3)	1.8 (1.1-3.0)
Asthma-	1993	6.7 (5.7-7.9)	1
Diabetes mellitus+	47	8.5 (3.2-20.6)	1.3 (0.4-3.0)
Diabetes mellitus-	2050	6.9 (5.9-8.1)	1

CI, confidence interval; + means present; - means absent. Gureje et al. JAGS 2008; 56: 2033- 2038

Prospective studies have provided more evidence in regard to the complex relationship between the brain and body and in regard to the occurrence of mental and physical disorders. Such studies have shown that patients with depression and anxiety have elevated risks of coronary disorders such as angina and myocardial infarction and that depression constitutes an independent risk factor for stroke even when factors such as age, smoking, body mass index, alcohol consumption and other chronic medical conditions are controlled for (73-75).

The bidirectional relationships between mental illness and physical disorders have also been demonstrated by prospective longitudinal studies. These studies show that mental and physical disorders not only have a tendency to occur together, but that the occurrence of one can be the risk factor that sets off the onset of the other. Evidence is growing confirming the observation that physical illness is as likely to precede mental disorders as the reverse is likely to occur. Studies conducted in primary care in 15 countries demonstrated the bidirectional relationship between pain and depression. In that study, over a 12-month period, the risk of depression among patients with persistent pain at baseline was similar to the risk of new onset of persistent pain among subjects with depression at the baseline, with the risk being elevated 2-fold in either case (76). Golden and colleagues, over a 3-year period, have demonstrated a similar relationship between depression and diabetes (77). In their study, the risk of incident depression among patients with diabetes at baseline was similar

to the risk of incident diabetes among patients with depression at the baseline.

The complexity of the relationship between the brain (or mind) and the body means that the mind-body dualism embedded in the work of the philosopher, Rene Descartes, is now regarded as a false and flawed dichotomy(78). The mind is intricately and inextricably linked to the body. And the brain is the arbiter of the link. This link manifests not only in the relationship between disorders of the brain and the body, as we have identified, but also in the causes of those disorders.

Mental and physical disorders often share common risk origins (79, 80). Because of the distal temporal relationship between these risk factors and the disorders that they predispose to, it is common not to appreciate the link. The studies of the adult consequences of adverse childhood experiences have provided a compelling picture of the enduring effect of brain mechanisms and functions on the totality of health and disease, irrespective of whether the disease is that of the brain or of the body. As others have shown in different populations, the links between these experiences and adult-onset mental disorders have been demonstrated in Nigeria. In the Nigerian Survey of Mental Health and Wellbeing, persons who experienced physical abuse, household conflict or frequent hunger before the age of 16 years were at elevated risk to develop adult mood and substance use disorders (81). What is interesting is that similar observations

have been made in respect to the link between adverse childhood experiences and adult physical disorders. For example, the observation has been made that persons with these childhood experiences have an increased likelihood of developing asthma in adulthood and that the risk is higher the more of such experiences they were exposed to (82).

The evidence for an enduring effect of early stress has been strengthened by the observation that adverse childhood experiences predispose not only to disorders but to the risk factors for those disorders. Felitti and colleagues have shown that persons who had been exposed to four or more categories of such experiences in childhood, including sexual and physical abuse as well as household dysfunction, had 4-12 fold risk for alcoholism, drug abuse, depression and suicide attempt, 2-4-fold increased likelihood to smoke and engage in risky sexual behavior and substantially elevated risk to be severely obese (83). In addition, these workers demonstrated that as the number of adverse experiences reported increased so did the likelihood of ischemic heart disease, cancer, chronic lung disease and liver disease.

WHAT IS THE BASIS OF THIS LINK?

There are now several lines of evidence that provide an understanding of the link between early adverse experiences and adult-onset mental and physical disorders. One such line of evidence shows that adverse childhood experiences are

associated with heightened hypothalamus-pituitary-adrenal axis activity which results in the production of abnormal levels of glucocorticoids and catecholamines. Even though the release of normal quantities of these chemicals are adaptive in normal bodily functioning, helping us to cope with stress, excessive release can lead to damage of the hippocampus in the brain and various other body organs (84, 85). Also, studies in the field of social neuroscience have provided evidence for the effects of social stress on gene regulation and the epigenome (86, 87). Gene regulation resulting from stress leads to long-lasting changes in behavior, cognition, mood and endocrine responses, all of which predispose to stress-related diseases later in life. For example, we now understand that the reason why socially isolated individuals may show heightened vulnerability to cardiovascular diseases is because of the excessive activity of genes supporting the early "accelerator" phase of the immune response, a response that leads to the production of inflammation (88). In fact, to further show the impact of our brain on the state of our health, we now know that these gene expression profiles are more strongly related to a person's subjective sense of isolation, and much less due to the objective number of social contacts the person may have. In effect, social influences, including perceived social situation, do penetrate deeply into our bodies and they do so through the workings of our brains(58, 88). If you think and believe you are lonely, even if you have people around you, your brain will send signals to your body to react as if you were truly lonely and isolated.

Anyway, in regard to comorbidity between mental and physical disorders, whatever may be its trajectory, the co-occurrence of mental and physical disorders bodes ill for the outcome of both conditions both in terms of overall disability and outcome (65, 89-95).

TREATMENT GAP FOR MENTAL DISORDERS

The slogan, No Health Without Mental Health (96), can probably be best appreciated when the full ramifications of the control of our brain on our health, both mental and physical, are understood. Unfortunately, this important message is not widely appreciated. Otherwise, the serious treatment gap that exists for mental disorders around the world, and in particular in low- and middle-income countries, would not be the case.

It is clear that a health system cannot be considered to be functioning properly if it is unable to protect and take care of the basic health rights and needs of the sick and the vulnerable including people with mental illness. In many low- and middle-income countries the resources for mental health care are extremely meager. Even though the burden of mental disorders in these countries is more than 10% of the total disease burden, the budget allocated to mental health is often between 0.5% and 1.9%. Indeed, in Nigeria, there is no specific programmatic budget for mental health service, only payment of salaries and running of a few hospitals. This means that more cost-effective and

equitable community-based services are not promoted or supported. Nigeria has about 1 psychiatrist to a population of 1 million people and fewer neurologists and psychologists. Most of these specialists are of course based in a few urban centers. When this is compared to a ratio of 10 psychiatrists to a population of 100,000 in Western Europe, where there is no indication of a higher burden of mental disorders, the resource constraint can be better appreciated. Unfortunately, primary care workers who should provide care for the more common mental health conditions are poorly trained and supervised. The result of this inadequate, inequitable and inefficient resourcing for mental health is a substantial treatment gap. Findings from the World Mental Health Surveys showed that between 76% and 85% of people with severe mental disorders in low-income countries had not received any treatment in the previous 12 months(97). In that study, only about 20% of Nigerians with severe but common mental disorders had received any form of treatment in the 12-month period. Among the few who received some treatment, only about 10% received what could be described as minimally adequate treatment and there was often a delay of about six years before onset of illness and receipt of treatment (98). The adverse consequences of this unmet need include unnecessary suffering for affected persons and their families. The consequences can extend beyond the patient. We know that about 15% of women experience depression during pregnancy or after childbirth. One of the long-term consequences of untreated perinatal depression is that the infants of the affected mothers may suffer growth

retardation, or stunting, and impaired brain development (99, 100).

The level of unmet need for mental health care is paradoxical given that there are very effective, safe and cost-effective treatments for most of these disabling conditions. For example, the antidepressant amitriptyline is cheap and effective. A recent Cochrane review of the medication, involving 18 randomized controlled trials and 1987 participants, shows that it is significantly more effective than placebo, with almost a 3-fold rate of response (101). In actual fact, this efficacy profile is not unique to amitriptyline. Most medications used to treat mental health conditions are similar in efficacy to those used in physical medicine. A review of 94 meta-analyses of 48 drugs used for 20 physical diseases (such as hypertension, diabetes, rheumatoid arthritis, asthma and migraine) and of 33 meta-analyses of 16 drugs used in 8 psychiatric disorders (such as schizophrenia, bipolar disorder, major depression and Alzheimer's disease) shows similar effect sizes for the two groups of disorders - a mean effect size of 0.45 (95%CI 0.37 0.53) for medications for physical conditions and 0.49 (95% CI 0.41 0.57) for those for mental health conditions(102). And yet, around the world, and particularly in low- and middle-income countries, persons with many common mental disorders are much less likely to receive any treatment compared to persons with common physical disorders (see Table 4 for example from the World Mental Health Surveys)(46).

Table 4: Disorder-specific rates of treatment in the prior 12 months in the WHO World Mental Health Surveys (adapted from Ormel et al. 2008)

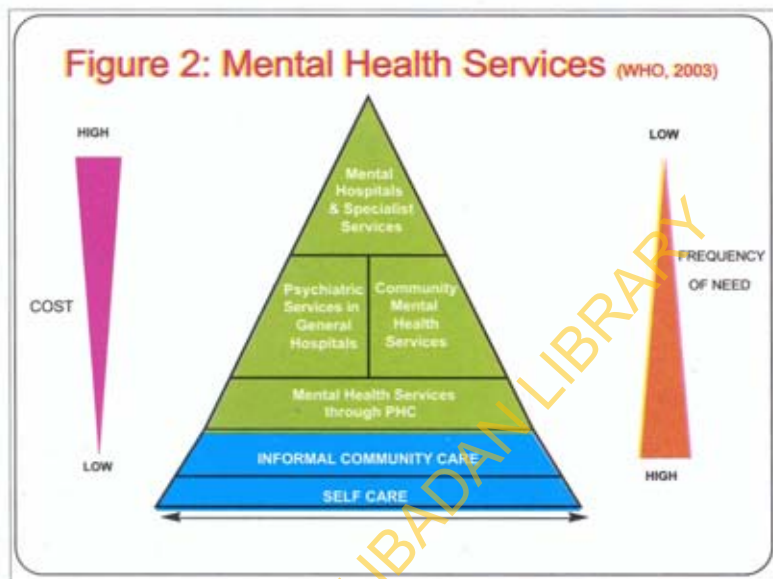
Conditions		High-income countries	Low- and middle-income countries
		% (se)	% (se)
Physical disorders	Arthritis	50.9 (1.8)	46.6 (4.1)
	Asthma	51.0 (3.7)	61.4 (5.4)
	Cancer	51.8 (5.2)	59.6 (10.2)
	Diabetes	94.4 (1.2)	76.6 (5.7)
	High blood pressure	90.2 (1.4)	69.8 (2.7)
Mental disorders	Bipolar disorder	29.1 (2.0)	13.4 (3.4)
	Depression	29.3 (1.1)	8.1 (1.1)
	Generalized anxiety disorder	31.6 (1.8)	7.2 (1.9)
	Panic disorder	33.1 (2.2)	9.4 (2.4)
	PTSD	29.5 (1.9)	8.1 (3.2)

Compounding the paradox is the fact that many of the more common mental health conditions may not always require medication but can be alleviated by the use psychological interventions by trained personnel. Even for this, there has been major progress in our understanding of how psychotherapy works and what changes it brings about in our brains to effect recovery from illness (103).

THE REASONS FOR THE TREATMENT GAP

So, why is there so much unmet need for treatment for mental illness?

It is commonly agreed that the best way to increase service coverage for most non-communicable diseases is to integrate their care into primary care service(104-106). The principle is true for mental disorders as it is for other non-communicable diseases. For mental disorders, this goal is desirable not only because of the paucity of mental health specialists, as I have already pointed out, but also because many of these health conditions can indeed be effectively treated or managed by non-specialists., In actual fact, throughout the world, most people with mental health conditions who receive treatment do so from non-specialists. As the WHO has shown (see Figure 2), the integration of mental health care into primary care is also more cost-effective as it utilizes less costly resources to provide service to large numbers of persons in need.(107).



A major barrier to the effective integration of mental health care to primary care is the lack of adequate training for primary health care providers to detect and treat common mental health conditions (105). There is evidence that these providers, even when they are non-physicians as is commonly the case in Nigeria, can be trained to provide essential first-line service for the most common mental health conditions. A new tool, developed by the WHO, the Mental Health Gap Action Programme Intervention Guide (mhGAP-IG), is specifically designed to facilitate such training(108). After adapting it for use in Nigeria(109), we have

recently used it to train hundreds of primary care providers in the provision of mental health care to people in need.

Many people with mental illness, especially those with the more severe forms of the illness, will seek treatment from traditional and faith healers. This is not only because of the fact that these healers are more abundant in number than providers of conventional health care, it is also because of the belief system that most people in the community have about the causation of mental illness. There is the common belief that these disorders are caused by supernatural factors, such as curse or spiritual attack. While it is probably easy to see the falsity of such belief, given that mental disorders, as I have shown in this lecture, occur in every community and in every racial group around the world, it is nevertheless a pervasive belief, especially among people in low- and middle-income countries. We therefore cannot ignore the existence of traditional and faith healers in any attempt to scale up and improve mental health service. Unfortunately, some of the more serious human rights abuses and inhumane forms of treatment take place in the context of traditional and faith healing practices. We are currently engaged in a program of work, being conducted in Ghana, Kenya South Africa, Liberia and here in Nigeria, to test the feasibility and effectiveness of collaboration between traditional and faith healers, on the one hand, and

primary care providers, on the other, in the provision of care for persons with severe mental disorders (www.pam-d.org). We are particularly interested in identifying the scope of such collaboration and to see whether collaboration will reduce harmful treatment practices.

STIGMA AND POLICY NEGLECT

An overarching factor responsible for the huge treatment gap that we have highlighted is policy neglect at all levels of government. This neglect is to a large extent driven by a lack of appreciation of both the magnitude and the consequences of mental illness, not only to individuals and their families, but also to the nation in the form of loss productivity. Mental health is intricately linked to societal cohesion and to overall economic and social development (110). Policy makers are also commonly unaware of the availability of effective and cost effective measures that can be taken to redress mental health problems. But beyond this, much of the neglect of mental health most commonly comes down to communities' and policy makers' discomfort with or aversion to people with troubled minds. As we have shown in a large community study, this aversion transcends even educational status (111). The deep and wide-ranging stigma that surrounds mental ill-health has an inevitably negative influence on the political processes that determine how priorities for health are set

and how resources are allocated. Stigma results in poor funding for mental health, even within the overall poor funding for health in general that is a perennial problem in this country.

Stigmatization of illness is of course not limited to mental illness (112). But it is more pervasive for persons with known mental health conditions and their families. Indeed, the ramification of stigma is such that it sometimes includes professionals who are in the business of caring for persons with mental disorders.

Most psychiatrists will probably have interesting stories to tell about their personal experience of the stigmatization of mental illness and of psychiatrists themselves (113). One of the interesting things about the life of a psychiatrist must be to see the extent to which people often go to deny that either they or anyone else they know have a mental illness. One of the funniest experiences I have had occurred in the context of the award that we are marking its conferment today. It was in this same hall and it was on March 14, 2009 when the Ibadan College of Medicine Alumni Association was organizing a dinner on behalf of the then Minister of Health and myself. The compere at the occasion, a lady, was introducing me. And what did she say? Talking, apparently seriously, she said something to the effect that it was a real pity and that she could not help wondering why someone such as myself, perhaps she was alluding to my outward character or

look, I wouldn't know which, that someone like me would choose to have nothing else to specialize in but psychiatry! So, can you beat that! In spite of the award that everyone in the audience had gathered to celebrate, the compere of the occasion was still full of pity for the awardee!

Stigma can be understood as consisting of three major domains: problems of *knowledge*, which manifests as ignorance, problems of *attitudes*, manifesting as prejudice, and problems of *behavior*, which shows up as discrimination. An appreciation of these domains of stigma informs a project, Mental Health Leadership and Advocacy Programme, which we have been conducting over the past five years in the five Anglophone countries of Ghana, Liberia, Nigeria, Sierra Leone and The Gambia (www.mhLAP.org) (114). The idea is to educate and inform the public about the primacy of mental health to overall health and also to advocate for improved mental health service to the governments of the countries.

There is no doubt that hubris, driven by ignorance, is partly responsible for the stigmatization of mental illness. As it should have become clear from this lecture, when people actually have a better understanding of the wide-ranging effects of the brain on our lives, in health and in ill-health, including in physical ill-health,

their actions to mental illness would be informed by more acceptance, by more humility.

LEADERSHIP CHALLENGE IN NIGERIA: WHAT ROLE FOR NEUROSCIENCE?

So, we have talked about the humongous workings of the brain. And the huge progress that neuroscience has made in understanding these. While another form of hubris is justified by neuroscientists on the basis of the great strides that their field has made in the past several decades, there are also compelling reasons for humility. One of these is the fact that there is still so much we do not know. In fact, sometimes what we know is not sufficient to produce the real-life changes we would like to see. Let us give an example of what we would like to be able to do with neuroscience but cannot do with our current state of knowledge.

Some years ago, Professor Adeoye Lambo, one of the first laureates of the National Merit Award, must have been feeling concerned, perhaps even frustrated, about the state of the country. Even at that time, it was obvious to him that we were not where we should be as a richly endowed country. I personally think the situation with Nigeria has grown more dire since then. Anyway, Professor Lambo, in his usually perceptive manner, put the stagnant growth of the country to bad leadership. Sensing that we had probably been selecting, electing or in any other way, allowing

people with unsound mind to become our leaders, he suggested that perhaps the best way to avoid the drift was to subject any aspiring leader to *mental health evaluation to determine their suitability for higher office*. And, indeed in like manner, people have often asked me, perhaps rhetorically but not without a tinge of frustration, whether I did not think something was wrong with the brains of some of our leaders.

So, let us examine what neuroscience has taught us about one of the conditions that might handicap someone from being a good leader. Antisocial personality disorder, or psychopathy, is an example of such a condition. Psychopathy is characterized by a range of social aberrations. These include callous exploitation, lack of empathy for the suffering of others, untruthfulness, diminished response to cues of punishment and deficits in social emotions such as remorse or shame (115). Well, you can probably see that these are not uncommon features in the hierarchy of leadership in Nigeria. Functional neuroimaging suggests that impairment in the part of the brain known as prefrontal cortex may be a major feature in persons who manifest psychopathy (116, 117). One reported finding is that of reduced prefrontal gray matter volume (118). We can examine more closely one of the core features of psychopathy: *lack of empathy*. Empathy, the social-emotional response that is induced by the perception of another

person's affective state, such as pain, is a fundamental component of healthy social co-existence. Its absence is one of the hallmark deficits of psychopathy. The part of the brain responsible for this deficit can be evaluated by functional neuro-imaging. When individuals with strong psychopathic traits are put through experimental tests in which they are asked to imagine others in pain or distress, they exhibit deficits in the parts of the brain known as ventromedial prefrontal cortex and orbitofrontal cortex (119). These persons display selected impairment in parts of the brain that allow us to cognitively process facial cues or signs of distress in others. In effect, the suffering of others does not move them(120).

So, the question that must follow is: can we use these features to identify people who may not be fit for office? Unfortunately, the answer is no. This is because the science is not precise enough to be specific to only those with clinically significant levels of psychopathy. That is, the brain features that we find in those with psychopathic traits may also be found in some other people without the traits. The likelihood of wrong inference is therefore real and substantial. Anyway, you can well imagine what would be the chance of survival for any psychiatrist or clinical neuroscientist who says a desperate Nigerian politician is not fit for office on the

basis of the results of some tests, no matter how reliable and valid those results might be!

In actual fact, persons with mental illness who have received treatment and have recovered from their illness may be fit for office and for leadership positions. The mental health conditions that should preclude people from office are those affecting character, those enduring features of our day-to-day functioning that determine how we relate to others. People with character and personality impairments that should make them unfit for office or for leadership may never come to treatment and their problems may indeed not be easily detected by tests. The best way to make judgment about character and personality is to piece together the experience of those who have come in contact with those seeking positions of leadership. Those experiences are likely to indicate the traits that will become even more pronounced when they get to positions of power. So, while the brain certainly dictates what people will do when given a chance to lead, we do not at the moment have the laboratory tests to detect the signs to foretell their actions. Unfortunately, poverty and the allure of "*stomach infrastructure*" may not always allow people to make the right judgment! Anyway, sometimes it does seem as if a significant trait of psychopathy is indeed a pre-requisite for higher office in Nigeria!

HUBRIS AND HUMILITY OF A NIGERIAN CLINICAL NEUROSCIENTIST

Unlike the Nigerian political scene of which there is much to lament, those of us in clinical neuroscience fortunately have a reason for legitimate pride, even a measure of hubris. Our field has witnessed phenomenal stride since the beginning of the "Decade of the Brain" in the 1990's. Giant strides in neuroscience have led to the development of new and powerful tools that allow for the exploration of brain mechanisms that underlie our behavior as well as the disorders that afflict us as human beings. Here in Nigeria, members of my own generation of psychiatrists and clinical neuroscientists stand on the shoulders of such giants as Adeoye Lambo and Kayode Osuntokun who made great impact on the world stage. In that vantage position, our collective achievements have been remarkable and truly belie our small number. In this regard, I wish to particularly acknowledge the contributions of my colleagues with whom I have collaborated over the years and from whom I have learnt so much. However, that sense of pride, even of hubris, must be tempered by the realization that basic, affordable and adequate health care is still largely unavailable to the vast majority of those in need of treatment for mental and behavioural disorders in our country.

Policy attention to mental health remains grossly inadequate as health policy makers at all levels ignore the fact that mental wellbeing, mental health, mental capital and freedom from mental disorder are essential components of health and are necessary ingredients for national development (110). Also, our country, in spite of the vastness of its resources, does not have an institutionalized support mechanism for sustained health research. It is embarrassing to note that, for example, South Africa, a country that our re-based economy has recently beaten to the second place in Africa, provides a fertile ground for cutting-edge health research, supported by the government of the country through its Medical Research Council and other institutions. We ought to be doing far better than we are doing.

And it is with that humbling observation that I end this lecture.

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BioSketch

OYE GUREJE

CURRENT POSITION:

Professor of Psychiatry and Director, WHO Collaborating Centre for Research and Training in Mental Health, Neurosciences and Drug and Alcohol Abuse, Department of Psychiatry, University of Ibadan.

ACADEMIC QUALIFICATIONS

- MBBS - University of Benin, Benin-City, Nigeria
- Diploma in Psychiatry - University of Manchester, UK.
- MSc (Psychiatry) University of Manchester, UK
- PhD (Psychiatry), University of Ibadan, Ibadan
- DSc (Psychiatry), University of Ibadan, Ibadan

PROFESSIONAL QUALIFICATIONS

- Fellow, West African College of Physicians (Psychiatry)
- Fellow, National Postgraduate Medical College (Psychiatry)
- Fellow, Royal Australian and New Zealand College of Psychiatrists
- Fellow, Royal College of Psychiatrists (UK)

PROFESSIONAL MEMBERSHIPS

- Member, International Psychogeriatric Association.
- Member, Section on Schizophrenia, World Psychiatric Association.
- Member, Section on Epidemiology and Public Health, World Psychiatric Association.
- Member, Section on Schizophrenia, World Psychiatric Association
- Member, Collegium Internationale Neuro-Psychopharmacologicum.
- Member, World Federation of Societies of Biological Psychiatry

LEADERSHIP AND ADMINISTRATIVE EXPERIENCE

INTERNATIONAL

- Consultant, US Institute of Medicine (2000)
- Member of the Executive Committee, Section on Epidemiology and Public Health, World Psychiatric Association (Chairman of its Membership Subcommittee) (2002-2009)

- Quality Assurance Advisor for the World Health Organization on the World Health Survey (in South Africa, Ethiopia and Mauritius) (2002 – 2004)
- Member of the Editorial Board, Composite International Diagnostic Interview (2003 – present)
- Advisor to the WHO Director-General on Alcohol Policy and Strategy (2001-2004)
- Zonal Representative for West and Central Africa, World Psychiatric Association (2005 – 2008)
- Co-Chair of the Work Group on Cultural Adaptation, World Mental Health Surveys Consortium (2003 – present)
- Member of the Executive, World Mental Health Surveys Consortium (2006 – present)
- Member, Maudsley International Advisory Board (2007 – present)
- Member of the Executive, Global Movement for Mental Health (2007 – present)
- Chair, Scientific Committee, World Psychiatric Association Regional Meeting, Nairobi, Kenya (March 21-23, 2007).
- Member of the Editorial Group, World Psychiatric Association Educational Programme for Depression (2007 – 2009)
- Member of the Editorial Group, World Health Organization World Report on Disability (2007 – 2010)
- Member, World Psychiatric Association Task Force on Stigmatization of Psychiatrists and of Psychiatry (2007 – 2008)
- Member of the Advisory Group, Movement for Global Mental Health (2007 – present) (see www.globalmentalhealth.org)
- Chair, World Psychiatric Association Task Force on Brain Drain (2007 – 2008)
- Member, WHO International Advisory Group for the Revision of ICD-10 Mental and Behavioral Disorders (2008 – present)
- Member of the Faculty, Lundbeck International Neuroscience Foundation (2008 – present)
- Member, World Psychiatric Association Review Committee (2008 – 2011)
- Member of the Technical Working Group, World Health Organization report – "Dementia: a public health priority" (2010 – 2012)
- Consultant, World Psychiatric Association Review and Ethics Committee (2011 – present)
- President, African Association of Psychiatrists and Allied Professionals (2009 – 2014)
- Chair, Somatic Distress and Dissociative Disorders Work Group of the WHO International Advisory Group for the Revision of ICD-10 Mental and Behavioural Disorders (2011 – present)

- Co-Chair, Field Studies Coordinating Group of the WHO Advisory Group for the Revision of ICD-10 (2012 – present)

NATIONAL

- Assistant Editor-In-Chief, West African Journal of Medicine (1990-1995).
- Examiner, Fellowship programmes of both the West African Postgraduate Medical College and the National Postgraduate Medical College since 1994.
- Principal Investigator of the research consortium that conducted the first national mental health survey, conducted in 21 of the country's states, covering five of the six geopolitical regions, and in four languages (Efik, Hausa, Ibo and Yoruba) (2001-2003).
- Member, Faculty Board of Psychiatry, West African Postgraduate Medical College (2003-2009).
- Third Member of the Senate of the National Postgraduate Medical College, representing the Faculty of Psychiatry (2005-2008).
- President, Association of Psychiatrists in Nigeria (2005 – 2009).
- Member, National Committee for Development of Treatment Guidelines (WHO/Federal Ministry of Health) (2005 – 2007)
- Chair, Mental Health Action Committee of the Federal Ministry of Health (2008 – present)

The Committee was responsible for the drafting of the Mental Health Service Policy adopted by the National Council of Health in August, 2013. The Committee is currently engaged in the process of writing a Mental Health Plan for the country.

- Convener, WHO/WPA Ministerial Roundtable on Scaling-up Mental Health Service in Africa attended by the Ministers of health or their representatives from nine sub-Saharan African countries (October, 2009).
- Convener, WPA Regional Meeting held in collaboration with the African Association of Psychiatrists and Allied Professionals (October, 2009).
- Leader of the team that produced an adapted Mental Health Gap Action Plan Intervention Guide for Nigeria, working with several colleagues under the coordination of the Nigeria country office of the WHO and the Federal Ministry of Health (2010-2011).
- Director of an EC-funded project to implement the first pilot programme to use the WHO mhGAP-IG to scale-up mental health service in a state of Nigeria (Osun) (2010 – 2013).

INSTITUTIONAL

- Consultant Psychiatrist at the University College Hospital, Ibadan (1989 – present)
- Sub-Dean (Postgraduate), Faculty of Clinical Sciences and Dentistry, College of Medicine (1994- 1995)
- Professor of Psychiatry, University of Ibadan (1995 – present)
- Chairman, Strategy Planning Committee, Faculty of Clinical Sciences and Dentistry, College of Medicine, University of Ibadan, Ibadan (2000)
- Member, University of Ibadan Vision and Mission Committee, University of Ibadan (Chairperson of the Sub-Committee for the Vision and Mission Statement) (2000 – 2002).
- Chairperson, Postgraduate Committee of the College of Medicine, University of Ibadan, Ibadan (2000 – 2008).
- Chairperson, 10-Year Development Plan Committee, College of Medicine, University of Ibadan, Ibadan (2001 – 2002)
- Head, Department of Psychiatry (1999-2003; 2006-2010)
- Chair, University College Hospital Research Committee (2010-2012)
- Director, Institute of Neurosciences, University College Hospital, Ibadan (2011-2015)
- Chair, University of Ibadan Committee on Authorship Policy (2012-2013)

HONORS

- | | |
|-------------|--|
| 1986 – 1988 | W.H.O. Training Fellowship |
| 1987 -1989 | Honorary Research Fellow, Department of Psychiatry, University of Manchester, UK. |
| 2007 | Osun State Honors Award |
| 2008 | Nigerian National Order of Merit (NOM) |
| 2011 | Honorary Member, World Psychiatric Association |
| 2011 | Lifetime Achievement Award by the Ibadan College of Medicine Alumni Association (ICOMAA) Worldwide |
| 2013 | Fellow, Nigerian Academy of Science |

SELECTED EDITORIAL BOARDS

- Associate Editor, International Review of Psychiatry
- Associate Editor, World Journal of Biological Psychiatry (2010-2014)
- Editorial Board, Current Psychiatry Reports
- Editorial Board, Drug and Alcohol Dependence
- Editorial Board, Social Psychiatry and Psychiatric Epidemiology
- Editorial Board, Psychiatric Bulletin
- Editorial Board, Lancet Psychiatry
- Editorial Board, Global Mental Health
- Editorial Board, Epidemiology and Psychiatric Services

REVIEWER TO:**INTERNATIONAL JOURNALS:**

- The Australian and New Zealand Journal of Psychiatry,
- Psychological Medicine,
- British Journal of Psychiatry,
- American Journal of Medicine,
- Journal of Psychosomatic Research,
- Journal of Pain,
- Addiction,
- CNS,
- Social Psychiatry and Psychiatric Epidemiology,
- Psychological Reports,
- International Psychogeriatrics,
- Drug and Alcohol Dependence,
- Acta Psychiatrica Scandinavica,
- Pain
- The Lancet
- The Lancet Psychiatry
- PLoS Medicine
- PLoS One
- Pediatrics
- British Medical Journal
- Etc.

LOCAL JOURNALS:

- African Journal of Medicine and Medical Sciences,
- West African Journal of Medicine,
- Nigerian Journal of Medicine,
- Nigerian Postgraduate Medical Journal
- Annals of Ibadan Postgraduate Medicine.

ASSESSOR TO RESEARCH GRANT BODIES

- a) Department for International Development (DfID), UK
- b) Wellcome Trust, London
- c) National Research Council, South Africa
- d) Grand Challenges Canada
- e) Medical Research Council (UK)
- f) Economic and Social Research Council (UK)

ASSESSOR TO UNIVERSITIES

- a) University of Stellenbosch, South Africa
- b) University of Melbourne, Australia
- c) University of Manchester, UK
- d) King's College, London
- e) University of Lagos
- f) Ambrose Ali University, Ekpoma
- g) Osun State University
- h) Lagos State University
- i) Kwame Nkrumah University of Science and Technology

INVITED LECTURES, RELATED TEACHING ACTIVITIES

International invited lectures/policy engagement conducted in the following countries:

WHO African Region

- Ethiopia
- Ghana
- Kenya
- Liberia
- Namibia
- Sierra Leone
- South Africa
- The Gambia
- Uganda

WHO Americas Region

- Argentina
- Brazil
- Canada
- Chile
- Mexico
- USA

WHO East Mediterranean Region

- Egypt
- Jordan
- Sudan
- United Arab Emirates

WHO European Region

- UK
- Netherland
- Norway
- Sweden
- Italy
- Spain
- Germany
- France
- Estonia
- Czech Republic
- Turkey
- Portugal
- Switzerland
- Iceland

WHO South East Region

- India

WHO West Pacific Region

- Japan
- Australia
- Thailand
- Vietnam
- China

RESEARCH ACTIVITIES

- Funded research projects: 29
 - ❖ 21 as Principal Investigator

Competitive research grants secured from:

- World Health Organization
- Department of Health, Victoria, Australia
- Government of Australia
- CBM

- Wellcome Trust (UK)
- National Institute of Ageing (US)
- National Institute of Mental Health (US)
- European Commission
- Medical Research Council, South Africa
- Medical Research Council, UK
- Department for International Development (DfID)
- Grand Challenges Canada

SUMMARY OF PUBLICATIONS

- Papers published in peer-reviewed journals: 275
- Edited books: 6
- Book chapters: 25
- Reports and monographs: 10
- Commentaries, reviews, and others: 15
- Guest edited journal issues: 3

IMPACT METRICS

- Citations: (June 2015)
 - 17,844 (Google Scholar)
 - 10,941 (Scopus)
 - 13,336 (Web of Science)
- *H-index*:
 - 59 (Google Scholar)
 - 49 (Scopus)
 - 47 (Web of Science)
- Among the topmost 1% cited Scientists globally in the field of Psychology/Psychiatry (according to Thomson Reuters Institute of Scientific Information's Essential Science Index)



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