Research title:

Physician Career Satisfaction across Thirty Medical Specialties: A South African National Survey Study.

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Submission date:

November 2019.

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I, Jeremy David O'Kennedy, declare that the coursework Master's Degree mini-dissertation that I herewith submit in a publishable manuscript format for the Master's Degree qualification, MMed (Derm) at the University of the Free State is my independent work, and that I have not previously submitted it for a qualification at another institution of higher education.

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Abstract:

Background. Specialty satisfaction likely influences quality of work, physician burnout rates and occupation-specific depression and suicide risk. Satisfaction with relative compensation, work-life balance and perception of met expectations within specialty, all likely influences career satisfaction within specialty as well as overall satisfaction with specialty choice. Specialty-specific physician career satisfaction data are collected and published annually in the United States of America (U.S.) and parts of Europe. These data and survey results are freely available to medical professionals, medical students, companies and the public. They are also widely publicised in journals, magazines and interest articles. No such relatable comparative data exists for practising South African medical specialists.

Objective. To determine and compare the specialty-specific career satisfaction amongst practising South African medical specialists across 30 distinct medical specialties, via an electronic (email) questionnaire-based, respondent survey in 2018.

Methods. This was an electronic, email-administered, questionnaire-based, respondent survey study conducted via SurveyMonkey. Response data representing practising South African medical specialists across 30 distinct medical specialties (incl. general practice) were obtained and analysed for the period 1 May to 31 July 2018. A specialty-specific global career satisfaction score (GSS) was formulated, calculated and compared with the use of five separate parameters, measuring scale-weighted responses within each individual questionnaire.

Results. A total of 1610 practicing medical specialists were invited via email survey invitation. A total of 420 complete and qualifying response data sets were included). The response rate was 26%. A total of 17 specialties met the minimum respondent number of 10 respondents. Respondents represented specialists practicing in all nine Provinces. 60.95% of respondents indicated solo private, 15.71% combined (State/academic and private), 15.24% partnership private and 5.24% State/academic only, as their respective practice settings. 125 (29.76%) respondents were female. The most satisfied practising specialists according to the survey data are Dermatologists (75%), Ophthalmologists (74%), Oncologists (72%) and Radiologists (72%). The most dissatisfied specialists are General Internists (52%), Obstetrician and Gynaecologists (52%), General Practitioners (52%) and Nephrologists (54%). The mean GSS response is 12.34 and the median is 13 (standard deviation =4.01)

Conclusion. This survey study demonstrated a significant inter-speciality variability in career satisfaction parameters amongst practising South African specialists. Specialty-specific satisfaction score trends were comparable to similar survey studies done in the U.S. and parts of Europe. The international trend towards job dissatisfaction within certain medical specialties, is concerning and warrants further investigation, possible interventional analysis and the development of turn-around strategies.

Keywords:

Medical Specialty Satisfaction;

South African Physician Career Satisfaction;

South African Specialist Satisfaction;

Physician Career Satisfaction;

Physician Burnout;

Medical Specialist Suicide Rates;

Physician Depression;

Physician Work-life Balance;

Medical Specialist Compensation Satisfaction;

South African Medical Specialists Survey;

Dermatologist Career Satisfaction;

SA G.P. Satisfaction;

Physician Career Satisfaction Parameters.

List of Abbreviations:

U.S.; The United States of America.

GSS; Global Career Satisfaction Score.

G.P.; General Practitioner.

q(Q); Question.

SSS; Specific Satisfaction Score.

CSS; Compensation Satisfaction Score.

WLBSS; Work-Life Balance Satisfaction Score.

MESS; Met Expectations Satisfaction Score.

SCSS; Specialty Choice Satisfaction Score.

GLSS; General Life Satisfaction Score.

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Chapter 1

Literature Review:

The primary objective of this survey study was to determine and compare the specialty-specific career satisfaction amongst practising South African medical specialists across 30 distinct medical specialties. Specialty satisfaction (career satisfaction) likely influences quality of work, physician burnout rates and occupation-specific depression and suicide risk Satisfaction with relative compensation, work-life balance and perception of met expectations within specialty, all likely influence overall career satisfaction and satisfaction with specialty choice. Specialty-specific physician career satisfaction data are collected and published annually in the United States of America (U.S.) and parts of Europe. These data and survey results are freely available to medical professionals, medical students, companies and the public. They are also widely publicised in journals, magazines and interest articles. No such relatable comparative data existed for practising South African medical specialists.

Such data are important according to the author as it potentially allows for the identification of specialty-specific occupational concerns that could be further qualified or quantified and addressed. It could also potentially allow for identification of specialty-specific factors that may contribute to career dissatisfaction which could be shown to relate to depression and suicide risk. Country-specific data are necessary to identify and address Country-specific trends and concerns. Country-specific data are also necessary for evidence-based career guidance and counselling.

It was hypothesized by the author that there exists a directly proportional relationships between: [1]relative work-life balance satisfaction and specialty choice satisfaction; [2]relative compensation satisfaction and specialty choice satisfaction; [3]satisfaction with life in general and specialty choice satisfaction. It was also hypothesized that there exists a comparative correlation between North American and South African specialty-specific physician satisfaction trends.

Accordingly, secondary objectives of the survey study were to: [1]demonstrate a possible correlating relationship between specialist perception of compensation fairness, specialist satisfaction with work-life balance and specialist perception of met expectations within specialty, with the decision to re-choose ones' medical specialty; [2]compare high and low satisfaction specialty grouping and trend results in this South African survey to similar surveys conducted among practicing medical specialists practicing in the U.S. and parts of Europe.

As stated earlier, no South African specialty-specific comparative career satisfaction data have previously been made available, either in published or unpublished form, according to the authors search of the available literature. A search of the available literature revealed multiple previous North American and European studies. These include, the now well known and widely, quoted, cited and publicised, annual 'Medscape Physician Compensation and Lifestyle Reports', which survey physicians practicing in North America and is conducted and published by Medscape. These annual surveys of physicians practicing in North America have been conducted since 2011 and regularly includes more than 20 000 respondents.

In their comprehensive 1999 journal article entitled 'Measuring Physician Job Satisfaction in a Changing Workplace and a Challenging Environment' Konrad and colleagues[1] utilised previous research, physician focus groups, secondary analysis of survey data, interviews with physician informants and a multi-specialty physician expert panel, to identify distinct job facets or parameters directly associated with physician career satisfaction, and compiled statements

representing those facets. Facets or parameters identified from previously validated instruments included the following: compensation, autonomy, relationships with colleagues, relationships with patients, relationships with staff, resources and status. The newly identified parameters by Konrad and Thomas et al, with strong predictor values for physician career satisfaction, included the following: [1]intrinsic satisfaction, [2]free time away from work or work-life balance, [3]administrative support, and [4]community involvement. These findings caused the investigators in the above study to further expand and investigate their list of physician career satisfaction predictor parameters or facets. The final fifteen included parameters or predictor facets were listed as follows: [1]'Autonomy.' Satisfaction with the independence of action. This included having input in important decisions and treating patients according to the best of the clinicians own clinical judgment. [2]'Relationships with colleagues.' Satisfaction with relationships with other physicians both in the community and within their practice setting. [3]'Relationships with nurses and other health professionals.' Satisfaction with relationship with nurses and other clinical personnel in the physician's work environment. [4]'Relationships with patients.' Satisfaction with the quality and duration of patient relationships. [5]'Compensation.' Satisfaction with total compensation and comparative compensation. Direct pay, financial or non-financial fringe benefits, and future prospects for financial security. [6]'Resources.' Satisfaction with the quality of people, facilities, and materials for clinical practice. [7]'Status.' Satisfaction with the respect received from patients, their families, the general community and colleagues. [8]'Personal time or work-life balance.' Satisfaction with the quality and quantity of time to self and family. [9]'Day to day practice administration.' Satisfaction with dealing with the day to day aspects of the physician's medical practice. This includes supervision of personnel, financial management, paperwork and all administrative tasks, and case reviews. [10]'Bureaucracy.' Satisfaction in dealing with the external agencies, e.g., utilization review, gatekeeping functions, defensive medicine, and oversight from various governing bodies. [11]'The work itself.' The satisfaction that comes from doing the day-to-day job, which may include; intellectual stimulation, utilization of a variety of skills, and providing quality care. [12]'Relationships with other personnel in the practice organization.' Satisfaction with relationship with clerical and administrative personnel in the practice setting. [13]'Altruism and outreach.' Satisfaction with being able to make a difference in patients' lives and within the community at large. This includes providing significant help to patients, families, and the community. [14]'Educational preparation.' Satisfaction with the amount and quality of medical school and residency education (e.g., clinical relevance or perceived omissions in education). [15]'Teaching role.' Satisfaction with the physicians 'role as an instructor of medical students and/or residents. Intellectual stimulation from teaching, time needed for teaching, and students' receptivity.

In their 2015 review study Hoff[2] et al confirmed that autonomy, relative compensation, work-life balance and perceived job demands are several of the stronger predictor facets of physician career satisfaction. In their 2003 Swiss survey study involving 1184 Swiss physicians, Bovier and Perneger[3] positively identified 17 predictor factors or parameters of physician job satisfaction. Bouvier and Perneger also found that an increase in workload, work related stress and administrative burden, whilst a decrease in time available for family, friends or leisure (i.e. work-life balance) and work-related income (i.e. compensation) and prestige have a strong negative association with physician job or career satisfaction.

Based on these and other supportive works in the literature a shortlist of 5 physician career satisfaction measurement or prediction parameters was compiled and formulated into Likert-scale weighted questions by the author. The five Likert-scale questions (physician satisfaction predictor parameters or facets) consequently included in this South African survey study were

as follows: [1]'I feel fairly compensated for my work.'(CSS); [2]'I feel satisfied with my work-life balance.'(WLBSS); [3]'My chosen specialty has lived up to most of my positive expectations.'(MESS); [4]'Knowing what I know now, I would choose the same specialty again.'(SCSS); [5]'I feel satisfied with my life in general'(GLSS).

In their 2000 survey study of 166 General Internists in the U.S. and 2620 of their patients J.S. Haas[4] et al. found that after adjustment, the patients of physicians who rated themselves to be very or extremely satisfied with their work had higher scores for overall satisfaction with their health care and for satisfaction with their most recent physician visit. In 2015 Scheepers [5] et al. conducted a systematic review, studying the effect of physicians' occupational well-being and career satisfaction on the quality of patient care. Eighteen studies were included in their review and they concluded that most studies reported positive associations between physician occupational well-being and patient satisfaction, patient adherence to treatment, and interpersonal aspects of patient care. It is especially the review of Scheepers et al. which demonstrates the strong evidentiary support in the literature for the association between physician career satisfaction and quality of work or patient care. The abovementioned studies demonstrated this association, both as a patient-reported perception and after physician critical self-review. The demonstrated effect of physician career satisfaction on quality of work and direct patient care, serves as a sobering incentive for the importance of research, monitoring and strategy development within this occupational paradigm.

A number of studies have evaluated the role of burnout on physician-specific depression rates and suicidal ideation. Improved work satisfaction, less emotional exhaustion, and lower burnout scores have been positively associated with better physician mental health. Burnout, physician stress, and workplace satisfaction are important areas for future research to improve physician well-being. In 2009 Bovier[6] et al. conducted a large survey study among 1732 Swiss physicians to determine the relationship between physician work or career satisfaction and mental health and burnout. They found a positive correlation between better mental health in respondents with higher work-related satisfaction with current income and social prestige and professional relations, and in respondents with lower emotional exhaustion and higher personal accomplishment scores. They concluded that higher levels of these dimensions of work-related satisfaction seems to mitigate the relationship between emotional exhaustion and physicians' mental health. In his 2006 study among Hungarian health care professionals Piko[7] demonstrated that burnout, particularly emotional exhaustion is strongly related to job or career dissatisfaction.

The demonstrated association between physician career satisfaction and physician mental health status, which includes; physician-specific depression and suicide and burnout rates, clearly supports the rationale for increased research focus on physician career satisfaction. Until fairly recently, research pertaining to above was relatively scarcely conducted. Subsequently, early identification of problem trends and interventional programmes have lagged behind. This has undoubtedly contributed to the current unacceptably high levels of physician-specific depression, burnout and suicide rates. As mentioned earlier there is a demonstrated association between lower physician (and specialty specific) career satisfaction and further increased risk of depression and burn out and suicide rates. It has clearly become necessary to urgently investigate what the major contributors to increased career dissatisfaction are amongst physicians, particularly within certain specialties, and which interventional strategies could be implemented to curb this trend. Increased on-call responsibilities, longer typical and after-hour work weeks, all likely contribute to lower career satisfaction in some specialties. The above listed factors impact negatively on sleep, physical as well as relational

health status. Country-specific data are necessary to identify and address country-specific trends and concerns. Data should also be specialty-specific, to aid in development of specific, focussed and effective interventional strategies.

In 2009 Leigh [8] et al. analysed cross-sectional data from 6,590 physicians across forty-two specialties in the U.S. and completed a linear survey study (response rate 53%), comparing satisfaction of physicians in these specialties with those practicing family medicine. After adjusting for physician-, practice-, and community characteristics, paediatric emergency medicine, geriatric medicine, other paediatric subspecialties, neonatal/prenatal medicine, dermatology and child and adolescent psychiatry were all found to have significantly higher satisfaction scores than those practicing family medicine. Conversely physicians practicing pulmonology, nephrology and obstetrics and gynaecology were found to have a significantly lower career satisfaction than family physicians. Leigh et al. also found that satisfaction was significantly and positively related to income (compensation) and employment in a medical school but negatively associated with more than 50 work-hours per-week (work-life balance), being a full-owner of the practice, greater reliance on managed care revenue, and uncontrollable lifestyle (autonomy/work-life balance).

Medscape has released annual reports of the results of their survey of U.S. physicians since 2011 (-current).[9][10][11][12][13][14][15][16][17][18][19][20][21][22][23][24][25] The annual U.S. Medscape physicians reports of interest to this South African survey study are entitled; 'Medscape Physicians Compensation Report.' and 'Medscape Physicians Lifestyle Report.' These Medscape surveys regularly include more than 20 000 physician respondents in a single survey, representing practicing physicians in all 50 states and the 5 major U.S. territories. Up to 30 specialties are included in a single Medscape survey. Physicians are asked, amongst others; what their annual income is, whether they feel fairly compensated, whether they would choose to study medicine again and whether they would choose the same specialty again. Results are reported per specialty and compared on a percentage scale. Overall physician career satisfaction is calculated in the Medscape surveys, by addition and averaging of results of the latter three questions detailed above (physician career satisfaction predictor parameters or facets). The overall physician career satisfaction percentage score is then also reported and ranked on a specialty-specific percentage scale. Several major trends can be identified when examining and comparing the Medscape reports published from 2011-2019. The first demonstratable trend is the obvious grouping of specialties into those that regularly report high satisfaction and those that routinely report low or lower satisfaction. It is significant that the specialties typically contained in each grouping has remained relatively unchanged over almost a decade of self-reported physician satisfaction. The specialists that regularly report relatively high compensation satisfaction and high likelihood of re-choosing their specialties in the annual U.S. Medscape physicians reports are: Dermatologists, Ophthalmologists, Radiologists, Oncologists, Plastic Surgeons and Orthopaedic Surgeons. Conversely, the specialties that regularly fall within the low or lower career satisfaction grouping are: General Internal Medicine, Nephrology, Pulmonology, Neurology, Obstetrics and Gynaecology and Family Medicine. The longstanding, relative static nature of these specialty-specific trends, especially those reporting lower career satisfaction parameters, is concerning. It could be argued that all medical specialties and specialists are of equal justifiable importance within a large functioning health system. It therefore cannot be defensible or sustainable that certain specialties or specialists should continuously feel comparatively dissatisfied. This could result in the emergence of a myriad of negative and unsustainable secondary trends. Including the current world-wide trends of a relative decrease in residency applications and interest shown in previously traditionally popular specialties such as Internal Medicine, Obstetrics and Gynaecology and Family

Medicine. Conversely, there currently exists a lob-sided, unsustainable, increase in residency applications to smaller specialties which have regularly reported high career satisfaction trends over the last two decades (e.g. Dermatology, Ophthalmology, Plastic Surgery). This trend is both unsustainable and could cause gross shortages, especially within the larger, so-called primary health care fields of global health care provision systems.

Medscape also released their first 'National Physician Burnout and Depression Report' in 2018[26]. This survey and report were repeated and a parameter for 'suicide' included in January 2019[27]. The above two reports clearly demonstrated an overall correspondence between those specialties previously identified as forming a regular part of the grouping that reports low and lower career satisfaction parameters and higher rates of self-reported physician burnout, depression and suicidal ideation. This invariably leads to a strengthening of the body of growing evidence that there exists a strong association between low levels of reported career satisfaction in certain specialties and the growing epidemic of physician-specific burnout, depression and suicide rates. Measurement, monitoring and investigation of global physician career satisfaction trends can thus not be regarded as a simple exercise in occupational vogue, but rather as part of an urgent action campaign with the goal of intervention to safeguard the operational health system and global physician's mental health status.

Medscape released their first 'UK Doctors' Salary Report' in 2018[28], this UK physicians survey was repeated in 2019[29] (UK Doctors' Salary and Satisfaction Report'). Similar survey questions and result-categories to the U.S. report, were included. In February 2019 Medscape released their first global physicians survey report [30] ('Medscape Global Physicians' Burnout and Lifestyle Comparisons Report'), focussing again on physician-specific burnout rates, with the added Country-specific focus. No South African physicians (nor any practicing physicians within a Country on the African Continent) were included. Medscape's own attempts at both local and international expansion of their physician satisfaction surveys and their increased focus on burnout, depression and suicide rates, supports the author of this South African survey studies' previously stated motivation and rationale for the need for South African specialty-specific data. The annual Medscape physicians' reports have become widely publicised and recognized internationally and are considered by many authors as the benchmark of physician job satisfaction surveys. As such the Medscape report methodology and framework has greatly influenced the authors own survey and report structure and approach.

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Chapter 2: Manuscript of article for SAMJ.

Physician Career Satisfaction across Thirty Medical Specialties: A South African National Survey Study.

O'Kennedy JD.

Abstract:

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As stated earlier, no South African specialty-specific comparative career satisfaction data have previously been made available in published or unpublished forms. A search of the available literature revealed multiple previous North American and European studies.

In their comprehensive 1999 journal article entitled **'**Measuring Physician Job Satisfaction in a Changing Workplace and a Challenging Environment' Konrad and colleagues [1] utilised previous research, physician focus groups, secondary analysis of survey data, interviews with physician informants and a multi-specialty physician expert panel, to identify distinct job satisfaction predictor facets. The parameters identified by Konrad and Thomas et al, with strong predictor values for physician career satisfaction, included the following: [1]intrinsic satisfaction, [2]free time away from work (work-life balance), [3]income (compensation), and [4]community involvement. In their 2015 review study Hoff [2] et al confirmed that autonomy, relative compensation, work-life balance and perceived job demands are several of the stronger predictors of physician career satisfaction. In their 2003 Swiss survey study involving 1184 Swiss physicians, Bovier and Perneger[3] positively identified 17 predictor factors or parameters of physician job satisfaction. Bouvier and Perneger also found that an increase in workload, work related stress and administrative burden whilst a decrease in time available for family, friends or leisure (i.e. work-life balance) and work-related income (i.e. compensation) and prestige have a strong negative association with physician career satisfaction.

In their 2000 survey study of 166 general internists in the U.S. and 2620 of their patients J.S. Haas[4] et al. found that after adjustment, the patients of physicians who rated themselves to be

very or extremely satisfied with their work had higher scores for overall satisfaction with their health care and for satisfaction with their most recent physician visit. In 2015 Scheepers [5] et al. conducted a systematic review studying the effect of physicians' occupational well-being and career satisfaction on the quality of patient care. They concluded that most studies reported positive associations of occupational well-being with patient satisfaction, patient adherence to treatment, and interpersonal aspects of patient care. It is especially the review of Scheepers et al. which demonstrates the strong evidentiary support in the literature for the association between physician career satisfaction and quality of work or patient care.

A number of studies have evaluated the role of physician career satisfaction on rates of burnout, depression and suicidal ideation. Improved work satisfaction, less emotional exhaustion, and lower burnout scores have been positively associated with better physician mental health. In 2009 Bovier[6] et al. conducted a large survey study among 1732 Swiss physicians to determine the relationship between physician career satisfaction and mental health and burnout. They reported a positive correlation between better mental health in respondents with higher work-related satisfaction with current income and social prestige and professional relations, and in respondents with lower emotional exhaustion and higher personal accomplishment scores. In his 2006 study among Hungarian health care professionals Piko[7] demonstrated that burnout is strongly related to job or career dissatisfaction. Until fairly recently, research pertaining to physicians' mental health was relatively scarcely conducted. Subsequently, early identification of problem trends and implementation of interventional programmes have lagged behind.

Medscape has released annual reports of the results of their surveys of U.S. physicians since 2011.[9][10][11][12][13][14][15][16][17][18][19][20][21][22][23][24][25] The annual U.S. Medscape physicians reports of interest to this South African survey study are entitled; 'Medscape Physicians Compensation Report.' and 'Medscape Physicians Lifestyle Report.' These Medscape surveys regularly include more than 20 000 physician respondents in a single survey, representing practicing physicians in all 50 states and 5 major U.S. territories. Up to 30 specialties are included in a single Medscape survey. Physicians are asked, amongst others; what their annual income is, whether they feel fairly compensated, whether they would choose to study medicine again and whether they would choose the same specialty again. Several major trends can be identified when examining and comparing the Medscape reports from 2011-2019. The first demonstratable trend is the obvious grouping of specialties into those that regularly report high satisfaction and those that report low or lower satisfaction. It is significant that the specialties typically contained in each grouping remained relatively unchanged over almost a decade of self-reported physician satisfaction parameters. The specialists that regularly report relatively high compensation satisfaction and high likelihood of re-choosing their specialties are: Dermatologists, Ophthalmologists, Radiologists, Oncologists, Plastic Surgeons and Orthopaedic Surgeons. Conversely, the specialties that regularly fall within the low or lower career satisfaction grouping are: General Internal Medicine, Nephrology, Pulmonology, Neurology, Obstetrics and Gynaecology and Family Medicine. The longstanding, relative static nature of these specialty-specific trends, especially those reporting lower career satisfaction parameters, is concerning. It could be argued that all medical specialties and specialists are of equal justifiable importance within a well-functioning health system. It cannot therefore be defensible or sustainable that some specialties or specialists should continuously report comparative dissatisfaction. This could result in the emergence of a myriad of negative and unsustainable secondary trends. Which includes the current global trend of a relative decrease in residency applications and interest shown in traditionally popular specialties such as internal medicine, obstetrics and gynaecology and family medicine. Medscape also released their first 'National Physician Burnout, Depression and Suicide Report' in 2018 and 2019[26][29].

The above two reports clearly demonstrate an overall association between those specialties identified regular low and lower career satisfaction reporters and higher rates of self-reported burnout, depression and suicidal ideation. This invariably leads to a strengthening of the body of growing evidence that there exists a strong association between low levels of reported career satisfaction in certain specialties and the growing epidemic of physician-specific burnout, depression and suicide rates. Measurement, monitoring and investigation of international physician career satisfaction can thus not be regarded as a simple exercise in occupational vogue, but rather as part of urgent action with a goal of intervention to safeguard the operational health system and global physician's mental health.

Methods:

This was a Cross-sectional survey study using electronic (email) self-report, Likert-scale, questionnaire as conduction tool. SurveyMonkey was used to design and administer the survey. Potential respondent contact details (email addresses) was sourced via the South African medical specialist directories, available specialist directories of South African private hospital groups, available specialist directories of South African medical school directories, available specialist directories of South African state and academic hospitals, available specialist directories of South African private laboratory pathology groups and available specialist directories of the National Health Laboratory Service. The study population consisted of physicians registered to practise as medical specialists (incl. general practice), representing thirty distinct medical specialties, in South Africa. Males and females were included (no-proportion). Any age was included as long as the inclusion criteria was met. Any race was included as long as the inclusion criteria was met. The following medical specialties were included in the study population field: [1]Anaesthesiology, [2]Cardiology,[3]Cardiothoracic Surgery, [4]Dermatology, [5]Diagnostic Radiology, [6]Endocrinology, [7]Family Medicine, [8]Gastroenterology, [9]General Internal Medicine, [10]General Surgery, [11]General Practitioner, [12]Haematology, [13]Infectious Diseases, [14]Laboratory Pathology, [15]Nephrology, [16]Neurology, [17]Neurological Surgery, [18]Nuclear Medicine, [19]Obstetrics & Gynaecology, [20]Oncology, [21]Ophthalmology, [22]Otorhinolaryngology, [23]Orthopaedic Surgery, [24]Paediatrics, [25]Plastic Surgery, [26]Psychiatry, [27]Pulmonology, [28]Rheumatology, [29]Urology, [30]Vascular Surgery.

The following inclusion criteria was adhered to: [1]the respondent is a registered medical specialist in South Africa registered to practice in one of listed thirty specialty fields included in study population; [2]the respondent is currently in active practise; [3]the respondent is practising within South African borders (any of 9 provinces); [4]the respondent is in private/State/co-practice; [5]the respondent is a willing participation. The sample size parameters used, included a minimum number of ten respondents per represented specialty. There was only a minimum cut-off. Efforts were made to recruit and enrol as many respondents per specialty as possible. Informed consent was obtained from all participants in this anonymous survey study. Completion and submission of the electronic questionnaire constituted informed consent by the participant and this was clearly and visibly stated.

Pre-testing of the self-administered questionnaire was performed within a selected pre-test group of the target population. The pre-test group was selected using the same method of recruitment as for the rest of study participant group. One specialist per specialty was selected for the pre-test group by randomly selecting the first specialist to appear in each search result subset. Questions were answered electronically on the questionnaire and were posed in a closed rating-scale format, using bipolar-scales (Likert scales). Likert scale questions had a five-point weight-scale, with a corresponding weighted numerical score, (Strongly Disagree=0, Disagree=1, Agree Somewhat=2, Agree=3, Strongly Agree=4). The survey questionnaire included a total of 11 questions. The first 6 questions constituted general demographic and practice data, answered by selection via closed-selection drop-down box. Questions 1-6 included: [1]'What is your age (in years)?'; [2]'What is your gender?'; [3]'What is your current practice setting?'; [4]'What is your current practicing medical specialty?'; [5]'How many years have you been practicing in your specialty?'; [6]'In what Province do you currently practice?'. Questions 7-11 included: [7]'I feel fairly compensated for my work.'(CSS); [8]'I feel satisfied with my work-life balance.'(WLBSS); [9]'My chosen specialty has lived up to most of my positive expectations.'(MESS); [10]'Knowing what I know now, I would choose the same specialty again.'(SCSS); [11]'I feel satisfied with my life in general'(GLSS).

Responses to each of the weighted Likert scale questions (q7-11) were used to calculate specific satisfaction scores (SSS) per specialty (CSS; WLBSS; MESS; SCSS; GLSS) and finally a GSS per specialty. Initial gross bundling and analysis was performed by integrated SurveyMonkey automated analysis algorithms. Continuous supervision of incoming response data was conducted by the study investigator to monitor for any sign's user questionnaire difficulties or faulty procedural or analytical ques. The response-data received via the live SurveyMonkey database was both grossly automatically, and manually sifted and grouped according to pre-planned response result groupings.

All 1610 identified potential respondents received an initial survey invitation and information email, with the options of immediate response and completion or any-time 'opt-out'/ 'decline participation'. Potential respondents who had not yet submitted a response indicating either of above listed options, continued to receive a weekly reminder email, until a response was registered by the database. This process was continued for the period of 1 May to 31 July 2018 (92 calendar days), after which the survey was closed. At this stage, no further survey responses had been received for a period of more than 21 days and it was deemed that the survey response saturation had been reached. At the date of termination of the survey, a total of 420 complete and qualifying respondent data sets had been received and had gone through initial automated processing and analysis.

Final data processing and analysis to determine satisfaction score per response, per specialty and final overall GSS per specialty was performed manually using Microsoft Excel data spreadsheet and pre-programmed macros. Individual responses to each of the 5 Likert scale questions (q7-11), measuring SSS, was allocated a response score of 0-4 (Strongly Disagree=0, Disagree=1, Agree Somewhat=2, Agree=3, Strongly Agree=4). A SSS per question per specialty was then calculated by addition of all numerical weight scores (0-4) and then calculating a direct numerical average (min.=0.00; max.=4.00). An overall GSS per specialty was then calculated by direct addition of the 5 averaged SSS for a result total out of a maximum of 20 (4;4;4;4;4). This GSS was then converted to a percentage score, with averaging from the second decimal number. (0-100%). The GSS percentage score was used for final ranking of career satisfaction results.

As quality control and assurance measure, data capture, grouping and analysis was manually duplicated for a small comparative cohort to allow for gross error detection. Further, random sampling of 3 consecutive monthly data response subsets, consisting of ten respondents each, was manually decoded and analysed by the investigator. This was then compared to the electronic data collection and analysis done for the same subset, by the SurveyMonkey programme.

No names or specific personal identifying information was retained during any stage of data collection or analysis. There were no respondent identifiers captured in response data coding algorithms or on the SurveyMonkey platform. All manual data analysis was done by the investigator only, via a secure desktop platform and server. Collected, captured, reported, presented and published data and results does not contain any personal identifying data and groups all respondent-responses into de-identifying specific specialty clusters i.e. 'Dermatologists'. Informed consent was obtained from each respondent. The study results might offer the needed incentive and motivation to investigate and promote possible preventative measures and interventional protocols and as such, improve global occupational health and risk management parameters. Specifically, as it pertains to physician-specific mental health. Ethical clearance for this survey study was granted by the University of the Free State (UFS), Health Sciences Research Ethics Committee (HSREC).

Results:

A total of 1610 practicing medical specialists, across 30 distinct medical specialties (incl. general practice) were invited via electronic (email) survey respondent-invitation. A total of 420 complete and qualifying respondent data sets were included, with respondents representing all 30 included medical specialties. The overall response rate was 26%. The age range of respondents was 31 to >65 years (Table 1). Respondents represented specialists practicing in all 9 provinces (Table 2). 125 (29.76%) respondents were female. 256 respondents indicated solo private (60.95%),66 combined (15.71%) (State/academic and private),64 partnership private (15.24%), 22 State/academic only (5.24%), as their respective practice settings.125 (29.76%) respondents were female. A total of 17(30) specialties reached the minimum respondent frequency number (10) to qualify for inclusion in the final results ranking and GSS calculation (Table 3). The highest proportion of respondents indicated that they have been practicing their specialty for 6-15 years (Table 4).

The specialties with the highest GSS and thus specialty-specific career satisfaction, according to the survey data, are Dermatologists (75%), Ophthalmologists (74%), Oncologists (72%) and Radiologists (72%). The specialists that scored the lowest are Nephrologists (54%), Obstetrician and Gynaecologists (52%), General Internists (52%) and General Practitioners (52%) (Table 5). The mean GSS response is 12.34 and the median is 13 (standard deviation =4.01)

There was an overall correlation between specialty groupings found to have higher career satisfaction scores (SSS; GSS) in this South African survey study and those found to have higher self-reported career satisfaction in similar North American and European studies. There was an overall correlation between specialty groupings found to have lower career satisfaction scores (SSS; GSS) in this South African survey study and those found to have lower self-reported career satisfaction in similar North American and European studies.

There is also a demonstrated correlation between higher SSS, particularly CSS, WLBSS, MESS and GLSS and a higher positive weight response score as to whether a physician would choose the same specialty again (SCSS). This proportional relationship was present in 28 of the 30 surveyed specialties.

Discussion:

This 2018 South African multi-specialty physician career satisfaction survey study demonstrated a wide inter-specialty variation in self-reported career satisfaction parameters (GSS; SSS). Dermatologists, ophthalmologists, oncologists and radiologists had the highest global career satisfaction scores (GSS) in this study (Table 5).. Conversely, nephrologists, obstetrician and gynaecologists, general internists and general practitioners had the lowest self-reported career satisfaction scores. There was an overall correlation between specialty groupings found to have lower career satisfaction scores (SSS; GSS) in this South African survey study and those found to have lower self-reported career satisfaction in similar North American and European studies. This demonstrates concordance with international inter-specialty career satisfaction trends. This survey study also demonstrated a correlation between higher specific satisfaction scores (SSS), particularly satisfaction with compensation (CSS), satisfaction with work-life balance (WLBSS), satisfaction with met positive expectations (MESS), satisfaction with life in general (GLSS) and the self-reported probability that a physician would re-choose his or her given specialty.

The overall survey response rate was 26%. A general target response rate of 30-40% is recommended for most survey studies. This figure however is highly dependent on the type of survey study, size of target population and the nature of data sought. An overall response rate of 25-30% is acceptable for a survey study done within small (or scarce-skill) population subsets or limited professional cohorts. Although every effort was made to improve the response rate for each specialty cohort within this survey study, 13 of the 30 specialties did not meet the minimum study response rate criteria of 10 respondents per specialty. Possible limiting factors that lead to poor response rate within certain specialties are: [1]the lack of uniform, updated and properly administered specialty-specific practitioner databases in South Africa. (the author went to great lengths to compile a multi-specialty specialist contact detail database); [2]the relatively small number of actual practitioners of certain specialties in South Africa; [3]the busy typical specialist schedule and proportionate lack of interest in what is deemed further administrative tasks; [4]possible lack of perceived incentive. Possible retrospective recommendations would include seeking corporate funding, -marketing, -publication and -drive of an annual South African physician satisfaction survey. Comparative to the now popular annual Medscape physician surveys in the U.S. (WebMD) [5][6][7][8][9][10][11][12][13][14][15][16][17][18][19][20]. Greater future awareness of such an 'institutionalised' annual survey and the benefits of its data would certainly lead to increased response rate incentive. This could also aid in the development and maintenance of a South African specialist contact database. Such a database would be of benefit to a wide array of future researchers and potential research topics. A larger study cohort, including specifically those 13 specialties that did not meet the minimum response rate criterion and a higher overall specialist response rate, would be necessary to improve the study results' inclusivity and specificity.

This survey study is this first of its kind conducted in South African amongst a South African medical specialist cohort. Little to no published data exists regarding South African specialty-specific occupational satisfaction, lifestyle or career trends. Specialty-specific physician satisfaction data are collected and published annually in North America and parts of Europe. A number of studies have evaluated the role of burnout in physician depression and suicidal ideation. Improved work satisfaction, less emotional exhaustion, and lower burnout scores were associated with better mental health in a large study of Swiss physicians.[1][3] Burnout, physician stress, and workplace satisfaction are important areas for future research to improve physician well-being.

This South African survey data strongly corresponds with data from similar international survey studies, especially those conducted among the North American physician cohort, regarding common trends of overall career dissatisfaction and proportionally higher burn-out and depression rates within certain specialty groups (e.g. general internal medicine, obstetrics and gynaecology, pulmonology, family medicine, neurology)[2][21][22]. Conversely certain specialties and specialty subsets that have routinely reported higher career satisfaction and lower burn-out rates in international survey studies are echoed by this South African survey study (e.g. dermatology, ophthalmology, radiology, oncology, plastic surgery).

Conclusion:

This 2018 South African multi-specialty physician career satisfaction survey study demonstrated a wide inter-specialty variation in self-reported career satisfaction parameters (GSS; SSS). Dermatologists, ophthalmologists, oncologists and radiologists had the highest specific and global, self-reported career satisfaction scores (GSS; SSS) in this study (Table 5). Conversely, nephrologists, obstetrician and gynaecologists, general internists and general practitioners had the lowest reported career satisfaction scores. There was an overall correlation between specialty groupings found to have lower career satisfaction scores (SSS; GSS) in this South African survey study and those found to have lower self-reported career satisfaction in similar North American and European studies. This demonstrates concordance and correlation with international inter-specialty career satisfaction trends. This survey study is the first of its kind conducted in South Africa amongst a South African medical specialist cohort. Little to no published data exists regarding South African specialty-specific occupational satisfaction, lifestyle or career trends. Such data are important according to the study investigator as it potentially allows for the identification of specialty-specific occupational concerns that could be further qualified, quantified and addressed. It also potentially allows for the identification of specialty-specific factors that lead to career dissatisfaction which could be shown to specifically relate to depression and suicide risk. Country-specific data is necessary to identify and address country-specific trends and concerns. Country-specific data are also necessary for evidence-based career guidance and counselling. This South African survey data strongly corresponds with data from similar international survey studies, especially those conducted among the North American physician cohort, regarding common trends of overall career dissatisfaction and proportionally higher burn-out and depression rates within certain specialty groups (e.g. general internal medicine, obstetrics and gynaecology, pulmonology, family medicine, neurology). Conversely certain specialties that have routinely reported higher career satisfaction and lower burnout rates in international survey studies are echoed by the results in this South African survey study (i.e. dermatology, ophthalmology, radiology, oncology, plastic surgery). Physician depression, burnout and suicide rates are very important occupational health parameters and thus important research avenues for data collection. Until fairly recently, research pertaining to the above was relatively scarcely conducted. Subsequently, early identification of problem trends and interventional programmes have lagged behind. This has undoubtedly contributed to the current unacceptably high levels of physician-specific depression, burnout and suicide rates. There is a demonstrated association between lower physician (and specialty-specific) career satisfaction and an increased risk of depression, burnout and suicide rates. This global trend of chronic low career satisfaction within specific specialties, now also demonstrated in this South African cohort, is thus all the more concerning. It has become necessary to urgently investigate what the major contributors to increased career dissatisfaction are amongst these specialties and what possible interventional strategies could be implemented to curb this trend.

Tables:

Table 1: Respondent age data summary (Years).

Q1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
31-40.	81	19.29	81	19.29
41-50.	139	33.10	220	52.38
51-64.	141	33.57	361	85.95
65 or Older.	59	14.05	420	100.00

Table 2: Respondent practicing Province data summary.

Q6	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Eastern Cape.	26	6.22	26	6.22
Free State.	34	8.13	60	14.35
Gauteng.	178	42.58	238	56.94
Kwazulu-Natal.	59	14.11	297	71.05
Limpopo.	9	2.15	306	73.21
Mpumalanga.	5	1.20	311	74.40
North West.	12	2.87	323	77.27
Northern Cape.	4	0.96	327	78.23
Western Cape.	91	21.77	418	100.00
Frequency Missing = 2				

Table 3: Respondent frequency per specialty.

Q4	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Anesthesiology.	25	5.95	25	5.95
Cardio-thoracic Surgery.	8	1.90	33	7.86
Cardiology.	15	3.57	48	11.43
Dermatology.	29	6.90	77	18.33
Diagnostic Radiology.	22	5.24	99	23.57
Endocrinology.	6	1.43	105	25.00
Family Medicine.	5	1.19	110	26.19
Gastroenterology.	8	1.90	118	28.10
General Internal Medicine.	14	3.33	132	31.43

Table 3 (cont.): Respondent frequency per specialty.

Q4	Frequency	Percent	Cumulative Frequency	Cumulative Percent
General Practitioner.	15	3.57	147	35.00
General Surgery.	34	8.10	181	43.10
Hematology.	4	0.95	185	44.05
Infectious Diseases.	2	0.48	187	44.52
Laboratory Pathology.	5	1.19	192	45.71
Nephrology.	14	3.33	206	49.05
Neurological Surgery.	5	1.19	211	50.24
Neurology.	7	1.67	218	51.90
Nuclear Medicine.	5	1.19	223	53.10
Obstetrics and Gynecology.	33	7.86	256	60.95
Oncology.	13	3.10	269	64.05
Ophthalmology.	22	5.24	291	69.29
Orthopedic Surgery.	25	5.95	316	75.24
Otorhinolaryngology.	13	3.10	329	78.33
Pediatrics.	28	6.67	357	85.00
Plastic Surgery.	10	2.38	367	87.38
Psychiatry.	18	4.29	385	91.67
Pulmonology.	5	1.19	390	92.86
Rheumatology.	5	1.19	395	94.05
Urology.	21	5.00	416	99.05
Vascular Surgery.	4	0.95	420	100.00

Table 4: Practice duration data summary (Years).

Q5	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1-5.	65	15.63	65	15.63
16-30.	137	32.93	202	48.56
6-15.	148	35.58	350	84.13
More than 30.	66	15.87	416	100.00
Frequency Missing = 4				

Table 5: Ranked Specailty Global Career Satisfaction Score (GSS).

1.	Dermatology	14.97	**75%**
2.	Opthalmology	14.69	**74%**
	*Cardiothoracic Surgery (†8)	14.51	**73%**
	*Vascular Surgery (†4)	14.50	**73%**
3.	Diagnostic Radiology	14.43	**72%**
3.	Oncology	14.38	**72%**
4.	Cardiology	13.74	**69%**
5.	Orthopaedic Surgery	13.48	**68%**
6.	Plastic Surgery	13.30	**67%**
7.	Otorhinolaryngology	12.92	**65%**
	*Rheumatology (†5)	13.00	**65%**
	*Laboratory Pathology (†5)	12.80	**64%**
	*Infectious diseases (†2)	12.50	**63%**
	*Gastroenterology (†8)	12.51	**63%**
8.	Psychiatry	12.16	**61%**
	*Hematology (†4)	12.25	**61%**
9.	General Surgery	11.95	**60%**
10.	Paediatrics	11.70	**59%**
	*Nuclear Medicine (†5)	11.80	**59%**
	*Neurosurgery (†5)	11.60	**58%**
11.	Urology	11.38	**57%**
	*Endocrinology (†6)	11.32	**57%**
12.	Anesthesiology	11.04	**55%**
	*Family Medicine (†5)	11.00	**55%**
13.	Nephrology	10.85	**54%**
14.	Obstetrics and Gynaecology	10.43	**52%**
14.	General Practice	10.33	**52%**
14.	General Internal Medicine	10.33	**52%**
	*Neurology (†7)	9.44	**47%**
	*Pulmonology (†5)	8.60	**43%**

*Specialty had less than 10 respondents.

†Number of respondents.

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Acknowledgements:

My supervisor, Dr Frans Maruma.

My biostatistician, Mr Cornel van Rooyen

Conflict of Interest:

No conflict of interest to report.

Author Contributions:

Dr Jeremy D. O'Kennedy;

Majority contribution to conceptualisation, design, analysis and interpretation of data;

Sole drafting and critical revision of important scientific content;

Approval of the version to be published.

Funding sources.

Self-funded survey study.

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Health Sciences Research Ethics Committee

07-Aug-2018

Dear **Dr Jeremy O'Kennedy**

Ethics Clearance: **Physician Career Satisfaction across Thirty Medical Specialties: A South African National Survey Study.**

Principal Investigator: **Dr Jeremy O'Kennedy**

Department: **Dermatology (Bloemfontein Campus)**

APPLICATION APPROVED

Please ensure that you read the whole document

With reference to your application for ethical clearance with the Faculty of Health Sciences, I am pleased to inform you on behalf of the Health Sciences Research Ethics Committee that you have been granted ethical clearance for your project.

Your ethical clearance number, to be used in all correspondence is:**UFS-HSD2018/0486/2808**

The ethical clearance number is valid for research conducted for one year from issuance. Should you require more time to complete this research, please apply for an extension.

We request that any changes that may take place during the course of your research project be submitted to the HSREC for approval to ensure we are kept up to date with your progress and any ethical implications that may arise. This includes any serious adverse events and/or termination of the study.

A progress report should be submitted within one year of approval, and annually for long term studies. A final report should be submitted at the completion of the study.

The HSREC functions in compliance with, but not limited to, the following documents and guidelines: The SA National Health Act. No. 61 of 2003; Ethics in Health Research: Principles, Structures and Processes (2015); SA GCP(2006); Declaration of Helsinki; The Belmont Report; The US Office of Human Research Protections 45 CFR 461 (for non-exempt research with human participants conducted or supported by the US Department of Health and Human Services- (HHS), 21 CFR 50, 21 CFR 56; CIOMS; ICH-GCP-E6 Sections 1-4; The International Conference on Harmonization and Technical Requirements for Registration of Pharmaceuticals for Human Use (ICH Tripartite), Guidelines of the SA Medicines Control Council as well as Laws and Regulations with regard to the Control of Medicines, Constitution of the HSREC of the Faculty of Health Sciences.

For any questions or concerns, please feel free to contact HSREC Administration: 051-4017794/5 or email EthicsFHS@ufs.ac.za.

Thank you for submitting this proposal for ethical clearance and we wish you every success with your research.

Yours Sincerely

Dr. SM Le Grange
Chair : Health Sciences Research Ethics Committee

Health Sciences Research Ethics Committee
Office of the Dean: Health Sciences
T: +27 (0)51 401 7795/7794 | E: ethicsfhs@ufs.ac.za
IRB 00006240; REC 230408-011; IORG0005187; FWA00012784
Block D, Dean's Division, Room D104 | P.O. Box/Posbus 339 (Internal Post Box G40) | Bloemfontein 9300 | South Africa

B

Informed Consent

Physician Career Satisfaction across Thirty Medical Specialties: A South African National Study:

Dear Participant,

I invite you to participate in a research study entitled*:* **Physician Career Satisfaction across Thirty Medical Specialties: A South African National Study.**

I am currently a numbered Registrar in the Department of Dermatology at the University of the Free State, Universitas Academic Hospital, Bloemfontein. I am in the process of doing Master's Research as part of the MMED (Masters of Medicine) curriculum.

The purpose of the research is:

1. To determine the global career satisfaction amongst practising South African medical specialists across 30 distinct medical specialties, via email-based respondent survey in 2018.
2. To assess the influence of satisfaction/perception of compensation fairness, work/life balance and perceived met expectations on the choice to re-choose ones medical specialty and general state of happiness.
3. Respondents will represent practising South African medical specialists across 30 distinct and separate medical specialties (incl. General Practice)

The enclosed electronic questionnaire has been designed to collect information on:

I. To assess the influence of satisfaction/perception of compensation fairness, work/life balance and perceived met expectations on the choice to re-choose ones medical specialty and general state of happiness.

- Specialty satisfaction likely influences quality of work.
- Satisfaction with compensation, work/life balance and perception of unmet expectations within specialty, all likely influences global career satisfaction in specialty and satisfaction with specialty choice.
- Specialty specific physician satisfaction data is collected and published annually in North America and Europe.
- This data and survey results are freely available to medical professionals, medical students, companies and the public. It is also widely publicised in journals, magazines and interest articles.
- No such relatable comparative data exists for practising South African medical specialists.
- Such data is important according to the author as it:
    a. Potentially allows for the identification of possible specialty-specific occupational concerns that could be further qualified/quantified and addressed.

b. Potentially allows for identification of specialty-specific factors that lead to career dissatisfaction which has been shown to relate to depression and suicide risk.
c. Country-specific data is necessary to identify and address country-specific trends and concerns.
d. Such data is necessary for evidence-based career guidance and counselling.

* **Your participation in this research project is completely voluntary.**
* **You may decline altogether, or leave blank any questions you don't wish to answer.**
* **No rumination will be provided for participation.**
* **Completion of the online questionnaire will be deemed as your informed consent to take part in the survey study.**
* **Study results may be published or presented at applicable conferences.**

There are no known risks to participation beyond those encountered in everyday life.
Your responses will remain confidential and anonymous.
Data from this research will be kept under lock and key and reported only as a collective combined total.
No one other than the researchers will know your individual answers to this questionnaire.

If you agree to participate in this project:

I. Please answer the questions on the questionnaire as best and honestly as you can.
II. It should take approximately 5 minutes to complete.
III. Once all responses (answers) have been completed, kindly return your response form by simply 'clicking' on the 'complete and send' link in the bottom right corner.

If you have any questions about this survey study, feel free to contact Dr. Jeremy D. O'Kennedy:
Cell #: 071 471 748
Email address: jeremydavidokennedy@yahoo.com

Thank you for your assistance in this important and significant endeavor.

Sincerely yours,
Dr. Jeremy D. O'Kennedy
MBChB *(Pret.)*
Aviation Medicine *(Pret./IAM)*
Travel Medicine *(Wits./James Cook University)*
Intg. HIV/TB/STI MNGMT. *(FPD)*
Registrar, Department of Dermatology *(UFS.)*

C

General Demographic Data:
Please select the appropriate option from the selection options contained in each Drop-down box:

1. My Age is [In years]:
    I. 20-30
    II. 31-40
    III. 41-50
    IV. 51-65
    V. 65 or older.

2. My Gender is:
    I. Female
    II. Male.

3. My current practise setting is:
    I. Solo Private Practice
    II. Partnership Private Practice
    III. Practitioner in a State Health Facility
    IV. Practitioner in an Academic Sate Health Facility
    V. Combination [State/Academic + Private Practice].

4. My current practising Medical Specialty is [incl. General Practise]:
    I. Anaesthesiology
    II. Cardiology
    III. Cardiothoracic Surgery
    IV. Dermatology
    V. Diagnostic Radiology
    VI. Endocrinology
    VII. Family Medicine
    VIII. Gastroenterology
    IX. General Internal Medicine
    X. General Surgery
    XI. General Practitioner
    XII. Haematology
    XIII. Infectious Diseases
    XIV. Laboratory Pathology
    XV. Nephrology
    XVI. Neurology
    XVII. Neurological Surgery
    XVIII. Nuclear Medicine
    XIX. Obstetrics & Gynaecology
    XX. Oncology
    XXI. Ophthalmology

XXII. Otorhinolaryngology
XXIII. Orthopaedic Surgery
XXIV. Paediatrics
XXV. Plastic Surgery
XXVI. Psychiatry
XXVII. Pulmonology
XXVIII. Rheumatology
XXIX. Urology
XXX. Vascular Surgery.

5. The approximate time that I have practised in my current specialty is [In years]:
   I. 1-5
   II. 6-15
   III. 16-30
   IV. 30 or more.

6. I currently practice primarily in the following Province:
   I. Eastern Cape
   II. Free State
   III. Gauteng
   IV. Kwazulu Natal
   V. Limpopo
   VI. Mpumalanga
   VII. Northern Cape
   VIII. North West
   IX. Western Cape.

Please read the following 5 statements carefully and select the option which most truthfully and accurately represents your own personal feeling or point of view:

1. **I feel fairly compensated for my work.**
   – Strongly Disagree
   – Disagree
   – Agree Somewhat
   – Agree
   – Strongly Agree.

2. **I feel satisfied with my work-life balance.**
   – Strongly Disagree
   – Disagree
   – Agree Somewhat
   – Agree
   – Strongly Agree.

3. **My chosen Specialty has lived up to most of my expectations.**

– Strongly Disagree
– Disagree
– Agree Somewhat
– Agree
– Strongly Agree.

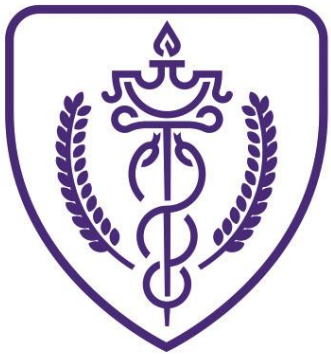
4. **Knowing what I know now, I would choose the same Specialty again.**
   – Strongly Disagree
   – Disagree
   – Agree Somewhat
   – Agree
   – Strongly Agree.
5. **I am satisfied with my life in general.**
   – Strongly Disagree
   – Disagree
   – Agree Somewhat
   – Agree
   – Strongly Agree.

D

Physician Career Satisfaction across Thirty Medical Specialties: A South African National Survey Study.

Study Protocol Version 1.2

2018/02/02



HEALTH SCIENCES
GESONDHEIDSWETENSKAPPE

UFS·UV

Contents:

1. **Study Team:**

I. **Principle investigator:**

Dr. Jeremy David O'Kennedy,
MBChB (Pret.); AvMed AME(Pret.); TravMed (Wits/James Cook.)
Registrar, Dept. of Dermatology
Universitas Academic Hospital
University of the Free State
1 Logeman Street
Bloemfontein
9301
RSA.

II. **Study Supervisor:**

Dr. Frans Maruma
MBChB; DipHivMed; A.H.M.P; Dip-Aesth.Med; MMed; FC-Derm
Acting Head: Clinical Department Of Dermatology
Faculty: Health Sciences
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III. **Statistician:**

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Researcher: Biostatistics
Faculty: Health Sciences
PO Box 339,
Bloemfontein 9300,
Republic of South Africa
051 4013114
VanRooyenFC@ufs.ac.za

2. **Study site/s:**

I. Department of Dermatology
University of the Free State
Francois Retief Building
Block F
205 Nelson Mandela Dr
Bloemfontein
9301.

II. Electronic email survey questionnaire
South African Nationals [Medical Specialist E-mail survey respondents].

3. Summary:

I. Study Title: Physician Career Satisfaction across Thirty Medical Specialties: A South African National Survey Study.

II. Objectives:

Primary Objective:

To determine the global career satisfaction amongst practising South African medical specialists across 30 distinct medical specialties, via an electronic questionnaire-based, respondent survey in 2018.

Respondents will represent practising South African medical specialists across 30 distinct and separate medical specialties (incl. General Practice). [[1]Anaesthesiology, [2]Cardiology, [3]Dermatology, [4]Diagnostic Radiology, [5]Endocrinology, [6]Family Medicine, [7]Forensic Pathology, [8]Gastroenterology, [9]General Internal Medicine, [10]General Surgery, [11]General Practitioner, [12]Haematology, [13]Infectious Diseases, [14]Laboratory Pathology, [15]Nephrology, [16]Neurology, [17]Neurological Surgery, [18]Nuclear Medicine, [19]Obstetrics & Gynaecology, [20]Oncology, [21]Ophthalmology, [22]Otorhinolaryngology [23]Orthopaedic Surgery, [24]Paediatrics, [25]Plastic Surgery, [26]Psychiatry, [27]Pulmonology, [28]Rheumatology, [29]Urology, [30]Vascular Surgery.]

Global career satisfaction with specialty choice will be calculated by further quantifying 5 separate parameters and measuring scale-weighted [Likert scale] responses in each individual questionnaire.

The 5 scale-weighted question parameters will include:

[1]I feel fairly compensated for my work.

[2]I feel satisfied with my work-life balance.

[3]My chosen specialty has lived up to most of my expectations.

[4]Knowing what I know now, I would choose the same Specialty again.

[5]I feel satisfied with my life in general.

Secondary Objective:

To assess the possible correlation between perception of compensation fairness, satisfaction with work-life balance and perceived met/unmet expectations on the decision to re-choose ones medical specialty.

Specialty satisfaction likely influences quality of work.

Satisfaction with relative compensation, work-life balance and perception of unmet expectations within specialty, all likely influences global career satisfaction in specialty and satisfaction with specialty choice.

Specialty specific physician satisfaction data is collected and published annually in North America and Europe.

This data and survey results are freely available to medical professionals, medical students, companies and the public. It is also widely publicised in journals, magazines and interest articles.

No such relatable comparative data exists for practising South African medical specialists.

Such data is important according to the study investigator as it:

[1]Potentially allows for the identification of possible specialty-specific occupational concerns that could be further qualified/quantified and addressed.

[2]Potentially allows for identification of specialty-specific factors that lead to career dissatisfaction which could be shown to relate to depression and suicide risk.

[3]Country-specific data is necessary to identify and address country-specific trends and concerns.
[4]Such data is necessary for evidence-based career guidance and counselling.

III. Design:

Discriptive research:

[1]A Cross-Sectional Survey Study using electronic [email] self-report, likert scale, questionnaire as conduction tool.

Experiments within Survey:

[1]Demonstrate a possible relationship between specialty dissatisfaction and dissatisfaction with life in general.
[2]Demonstrate a possible relationship between work-life balance satisfaction and specialty choice satisfaction as well as global career satisfaction.
[3]Demonstrate a possible relationship between relative compensation satisfaction and specialty choice satisfaction as well as global career satisfaction.
[4]Demonstrate a possible relationship between unmet expectations within specialty and specialty choice dissatisfaction as well as global career dissatisfaction.
[5]Compare specialty specific career satisfaction and other perception parameters of South African medical specialists with North American and European counterparts.

4. Introduction:

I. Background:

Specialty satisfaction likely influences quality of work.
Satisfaction with relative compensation, work-life balance and perception of unmet expectations within specialty, all likely influences global career satisfaction in specialty and satisfaction with specialty choice.
Specialty specific physician satisfaction data is collected and published annually in North America and Europe.
This data and survey results are freely available to medical professionals, medical students, companies and the public. It is also widely publicised in journals, magazines and interest articles.
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Such data is important according to the author as it:
[1]Potentially allows for the identification of possible specialty-specific occupational concerns that could be further qualified/quantified and addressed.
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[3]Country-specific data is necessary to identify and address country-specific trends and concerns.
[4]Such data is necessary for evidence-based career guidance and counselling.

II. Hypothesis:

[1]There is a proportional relationship between relative work-life balance satisfaction and specialty choice satisfaction.

[2]There is a proportional relationship between relative compensation satisfaction and specialty choice satisfaction.

[3]There is a proportional relationship between satisfaction with general life and specialty choice. Satisfaction.

[4]There is a proportional relationship between satisfaction with work/life balance, relative. satisfaction with compensation, met expectations and specialty choice satisfaction.

[5]There is a linear correlation between North American and South African specialty-specific physician satisfaction.

5. Literature Search:

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19. Compton MT, Frank E, Elon L, Carrera J. *Changes in U.S. Medical Students' Specialty Interests over the Course of Medical School.* J Gen Intern Med. 2008;23(7):1095–100.

20. Goldacre MJ, Laxton L, Lambert TW. *Medical graduates' early career choices of specialty and their eventual specialty destinations: UK prospective cohort studies.* BMJ. 2010;341:c3199.

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23. Stevens F, Philipsen H, Diederiks J. *Organizational and professional predictors of physician satisfaction.* Organiz Studies 1992;13:35-49.

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6. Objectives:

I. Primary Objective:

To determine the global career satisfaction amongst practising South African medical specialists across 30 distinct medical specialties, via an electronic questionnaire-based, respondent survey in 2018.

Respondents will represent practising South African medical specialists across 30 distinct and separate medical specialties (incl. General Practice). [[1]Anaesthesiology, [2]Cardiology, [3]Dermatology, [4]Diagnostic Radiology, [5]Endocrinology, [6]Family Medicine, [7]Forensic Pathology, [8]Gastroenterology, [9]General Internal Medicine, [10]General Surgery, [11]General Practitioner, [12]Haematology, [13]Infectious Diseases, [14]Laboratory Pathology, [15]Nephrology, [16]Neurology, [17]Neurological Surgery, [18]Nuclear Medicine, [19]Obstetrics & Gynaecology, [20]Oncology, [21]Ophthalmology, [22]Otorhinolaryngology [23]Orthopaedic Surgery, [24]Paediatrics, [25]Plastic Surgery, [26]Psychiatry, [27]Pulmonology, [28]Rheumatology, [29]Urology, [30]Vascular Surgery.]

Global career satisfaction with specialty choice will be calculated by further quantifying 5 separate parameters and measuring scale-weighted [Likert scale] responses in each individual questionnaire.

The 5 scale-weighted question parameters will include:

[1]I feel fairly compensated for my work.

[2]I feel satisfied with my work-life balance.

[3]My chosen specialty has lived up to most of my expectations.

[4]Knowing what I know now, I would choose the same Specialty again.

[5]I feel satisfied with my life in general.

II. Secondary Objective:

To assess the possible correlation between perception of compensation fairness, satisfaction with work-life balance and perceived met/unmet expectations on the decision to re-choose ones medical specialty.

Specialty satisfaction likely influences quality of work.

Satisfaction with relative compensation, work-life balance and perception of unmet expectations within specialty, all likely influences global career satisfaction in specialty and satisfaction with specialty choice.

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[2]Potentially allows for identification of specialty-specific factors that lead to career dissatisfaction which could be shown to relate to depression and suicide risk.

[3]Country-specific data is necessary to identify and address country-specific trends and concerns.

[4]Such data is necessary for evidence-based career guidance and counselling.

7. Study population:

[1]Purposive [non-probability] sampling;
[2]Quota Sampling;
[3]No-proportion.
[4]Physicians registered to practise as medical specialists (incl. general practice), representing thirty distinct medical specialties, in South Africa in 2018.

I. **Gender:** Males and Females [no-proportion]
II. **Age:** Any, as long as inclusion criteria met.[4]
III. **Race:** Any, as long as inclusion criteria met.[4]
IV. **Location:** Republic of South Africa [nationwide][4]

8. Inclusion/exclusion Criteria:

Inclusion Criteria:

I. Registered Medical Specialist in South Africa registered to practice in one of listed thirty specialty fields included in study population.
II. Currently in active practise.
III. Practising within South African borders [All provinces]
IV. Private/State/Co-practice.
V. Willing participation.

Exclusion Criteria:

I. Practising is Specialty other than thirty specialties included in study population.
II. Not a South African registered practitioner [HPCSA]
III. Not currently in active practice
IV. Practising outside of South African Borders
V. Not willing/does not consent to participate

9. Sample Size:

A minimum of 10 respondents per represented Specialty.
There is only a minimum cut-off. Efforts will be made to recruit and enrol as many specialists per specialty as possible.

10. Consent:

Informed consent will be obtained from all participants in this anonymous survey study.
Completion of the questionnaire constitutes informed consent by the participant.

11. Recruitment:

- A defined search of each specialty field in each of the nine provinces will be made on the following internet data bases; *samedicalspecialists.co.za, medpages.co.za, yellowpages.co.za, ratemd.co.za*
    - E.g. search: "Cardiologists in Limpopo'', ''Cardiologists in Mpumalanga'' etc [1-9 for each Province]
    - Attempts will then be made to contact each specialist sourced from this search result, equally, at least by email with information and consent.
    - Each specialist that appears within search results will be contacted for recruitment via email, telephonically if email address is not available, to request email address.

12. Study Procedure:

Pre-testing of the self-administered questionnaire will be performed with a selected pre-test group of the target population.
Pre-test group will be selected using the same method of recruitment as for the rest of study participant group and will be randomly included into the main study.
One specialist per specialty will be selected for pre-test group by randomly selecting the first specialist to appear in each search result, following each specialty along with each of nine Provinces, in a search sequence.
SurveyMonkey will be used to design and administer final online survey via email link.
An electronic questionnaire will be sent via email to respondents included in study population.
Candidates within study population will be sourced via the Medical Specialist online directories.
Questions will be answered electronically on the questionnaire and be posed in a closed Rating Scale Format, using bipolar scales. [Linkert scale]
Linkert scale questions will have a five-point response scale, with neutral in the middle.

The questionnaire will include 5 general Demographic closed response questions:
[1]Age?
[2]Gender?
[3]Practice setting?
[4]Practicing Specialty?
[5]Practicing Period?

Followed by 5 closed Likert scale response questions:
[1]I feel fairly compensated for my work. [1Strongly Disagree – 2.5Neutral – 5Strongly Agree]
[2]I feel satisfied with my work-life balance. [1Strongly Disagree - 2.5Neutral – 5Strongly Agree]
[3]I am happy with my life in general. [1Strongly Disagree - 2.5Neutral – 5Strongly Agree]
[4]My chosen specialty has lived up to most of my expectations. [1Strongly Disagree - 2.5Neutral – 5Strongly Agree]
[4]Knowing what I know now, I would choose the same specialty again. [1Strongly Disagree - 3.5Neutral – 7Strongly Agree]
[5]I am satisfied with my life in general. [1Strongly Disagree - 2.5Neutral – 5Strongly Agree]

13. Data recording

Computer-assisted-self-administered-interviewing [CASAI] of target population will be conducted using constructed questionnaire.
Projected response rate is 50-70%.
Once electronic email questionnaire is completed an auto-prompt will request the respondent to reply to email with completed questionnaire data form.
Completed questionnaire data forms received back via electronic response will be received by a central secure database construct accessible to study investigator/s only.
Receiving database will contain elementary algorithms for rapid initial sifting and grouping of received response-data.
Continuous supervision of incoming response data will be conducted by investigator to monitor for any signs of self-administered questionnaire difficulties/information misinterpretation.
Response-data received in database will be continuously sifted and grouped according to response result algorithm.
Finalization of response data will be considered when response-rate of between 50-70% has been achieved or a minimum of 10 responses per represented speciality/specialist.

14. Study Timeline:

Stage 1A:
Ethical/regulatory and academic approval of protocol and study.
Necessary adjustment if required.
[1 month]

Stage 1B:
Sourcing of National medical specialist

Stage 2:
Data collection and Analysis and respondent response/reply time-window.
[+-3 months].

Stage 3:
Presentation and Publication.
[Within 6-8 months of Stage 1].

Estimated start date: 2018-08-31.
Estimated end date: 2019-03-31.
Estimated total duration: 6-8 months.

15. Statistical considerations:

Data Source → Primary Data
↓
Description of Data and Sample
↓
Descriptive Statistics
↓
Frequencies and Percentages of Sample Data
↓
Plotting

16. Confidentiality:

No names or personal identifying information will be retained or published at any stage.
There are no respondent identifiers captured in response data coding algorithms.
All data analysis will be done by investigators only via secure desktop platform and server.
De-identifying Data Collection Forms will be used during data capture.
Both captured/reported/presented and published results will not contain any personal identifying data and will group all respondents responses into de-identifying specific specialty clusters i.e. "Dermatologists".

17. Quality control/Quality assurance:

Code and algorithm based data capture, grouping and analysis will be duplicated for better error detection.
Random sampling of data response will be manually decoded and analysed and then compared to electronic sample and analysis to ensure correct correlation.

18. Statement of Ethical considerations:

This survey study will be entirely anonymous with no disclosure of any personal identifying data.
The study results will offer invaluable insight into occupational trends and occupational risk factors among South African medical specialists.
The study results might offer the needed incentive and motivation to investigate and promote possible preventative measures/ intervention protocols.
Country-specific data is necessary to identify and address country-specific trends and concerns.
Such data is necessary for evidence-based career guidance and counselling.

19. Publication policy:

The aim is to make survey study results available to all study respondents as well as to other South African physicians, medical students and interested parties via open access publication on a medical website.
Approval for publication in a reputable South African medical journal will be sought.
Any presentation, abstract, or manuscript will be made available for review.

20. References:

1. McMurray J, Williams E, Schwartz M, et al. *Physician job satisfaction: Developing a model using qualitative data.* J Gen Intern Med 1997;12:711-714.
2. Medsape. *Physicians Compensation Report 2011.* [Internet Report]. Retrieved from https://www.medscape.com/viewarticle/740086_4 In Text: (Medscape, 2011).
3. Medscape. *Physicians Lifestyle Report 2012.* [Internet Report]. Retrieved from https://www.medscape.com/features/slideshow/lifestyle/2012/public In Text: (Medscape, 2012).
4. Medscape. *Physicians Compensation Report 2012.* [Internet Report]. Retrieved from https://www.medscape.com/features/slideshow/compensation/2012/public In Text: (Medscape, 2012).
5. Medscape. *Physicians Lifestyle Report 2013.* [Internet Report]. Retrieved from https://www.medscape.com/sites/public/lifestyle/2013 In Text: (Medscape, 2013).
6. Medscape. *Physicians Compensation Report 2013.* [Internet Report]. Retrieved from https://www.medscape.com/sites/public/physician-comp/2013 In Text: (Medscape, 2013).
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8. Medscape. *Physicians Compensation Report 2014.* [Internet Report]. Retrieved from https://www.medscape.com/sites/public/physician-comp/2014 In Text: (Medscape, 2014).
9. Medscape. *Physicians Lifestyle Report 2015.* [Internet Report]. Retrieved from https://www.medscape.com/sites/public/lifestyle/2015 In Text: (Medscape, 2015).
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11. Medscape. *Physicians Lifestyle Report 2016.* [Internet Report]. Retrieved from https://www.medscape.com/slideshow/lifestyle-2016-overview-6007335 In Text: (Medscape, 2016).

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14. Medscape. *Physicians Compensation Report 2017.* [Internet Report]. Retrieved from https://www.medscape.com/slideshow/compensation-2017-overview-6008547 In Text: (Medscape, 2017).
15. Medscape. *Physicians Lifestyle & Happiness Report: Physician burnout and depression 2018.* [Internet Report]. Retrieved from https://www.medscape.com/sites/public/lifestyle/2018 In Text: (Medscape, 2018).
16. Stanford. *Survey Research 2000.* [Internet Guideline Article]. Retrieved from http://web.stanford.edu/dept/communication/faculty/krosnick/Survey_Research.pdf In Text: (StanfordEdu, 2000).

NOTES:

FORM 1A

Informed Consent

Physician Career Satisfaction across Thirty Medical Specialties: A South African National Study:

Dear Participant,

I invite you to participate in a research study entitled*:* **Physician Career Satisfaction across Thirty Medical Specialties: A South African National Study.**

I am currently a numbered Registrar in the Department of Dermatology at the University of the Free State, Universitas Academic Hospital, Bloemfontein. I am in the process of doing Master's Research as part of the MMED (Masters of Medicine) curriculum.

The purpose of the research is:

4. To determine the global career satisfaction amongst practising South African medical specialists across 30 distinct medical specialties, via email-based respondent survey in 2018.
5. To assess the influence of satisfaction/perception of compensation fairness, work/life balance and perceived met expectations on the choice to re-choose ones medical specialty and general state of happiness.
6. Respondents will represent practising South African medical specialists across 30 distinct and separate medical specialties (incl. General Practice)

The enclosed electronic questionnaire has been designed to collect information on:

II. To assess the influence of satisfaction/perception of compensation fairness, work/life balance and perceived met expectations on the choice to re-choose ones medical specialty and general state of happiness.

- Specialty satisfaction likely influences quality of work.
- Satisfaction with compensation, work/life balance and perception of unmet expectations within specialty, all likely influences global career satisfaction in specialty and satisfaction with specialty choice.
- Specialty specific physician satisfaction data is collected and published annually in North America and Europe.
- This data and survey results are freely available to medical professionals, medical students, companies and the public. It is also widely publicised in journals, magazines and interest articles.
- No such relatable comparative data exists for practising South African medical specialists.
- Such data is important according to the author as it:
    a. Potentially allows for the identification of possible specialty-specific occupational concerns that could be further qualified/quantified and addressed.
    b. Potentially allows for identification of specialty-specific factors that lead to career dissatisfaction which has been shown to relate to depression and suicide risk.
    c. Country-specific data is necessary to identify and address country-specific trends and concerns.

d. Such data is necessary for evidence-based career guidance and counselling.

* **Your participation in this research project is completely voluntary.**
* **You may decline altogether, or leave blank any questions you don't wish to answer.**
* **No rumination will be provided for participation.**
* **Completion of the online questionnaire will be deemed as your informed consent to take part in the survey study.**
* **Study results may be published or presented at applicable conferences.**

There are no known risks to participation beyond those encountered in everyday life.
Your responses will remain confidential and anonymous.
Data from this research will be kept under lock and key and reported only as a collective combined total.
No one other than the researchers will know your individual answers to this questionnaire.

If you agree to participate in this project:

IV. Please answer the questions on the questionnaire as best and honestly as you can.
V. It should take approximately 5 minutes to complete.
VI. Once all responses (answers) have been completed, kindly return your response form by simply 'clicking' on the 'complete and send' link in the bottom right corner.

If you have any questions about this survey study, feel free to contact Dr. Jeremy D. O'Kennedy:
Cell #: 071 471 748
Email address: jeremydavidokennedy@yahoo.com

Thank you for your assistance in this important and significant endeavor.

Sincerely yours,
Dr. Jeremy D. O'Kennedy
MBChB *(Pret.)*
Aviation Medicine *(Pret./IAM)*
Travel Medicine *(Wits./James Cook University)*
Intg. HIV/TB/STI MNGMT. *(FPD)*
Registrar, Department of Dermatology *(UFS.)*

General Demographic Data:
Please select the appropriate option from the selection options contained in each Drop-down box:

6. My Age is [In years]:
    I. 20-30
    II. 31-40
    III. 41-50
    IV. 51-65
    V. 65 or older.

7. My Gender is:
    I. Female
    II. Male.

8. My current practise setting is:
    I. Solo Private Practice
    II. Partnership Private Practice
    III. Practitioner in a State Health Facility
    IV. Practitioner in an Academic Sate Health Facility
    V. Combination [State/Academic + Private Practice].

9. My current practising Medical Specialty is [incl. General Practise]:
    XXXI. Anaesthesiology
    XXXII. Cardiology
    XXXIII. Cardiothoracic Surgery
    XXXIV. Dermatology
    XXXV. Diagnostic Radiology
    XXXVI. Endocrinology
    XXXVII. Family Medicine
    XXXVIII. Gastroenterology
    XXXIX. General Internal Medicine
    XL. General Surgery
    XLI. General Practitioner
    XLII. Haematology
    XLIII. Infectious Diseases
    XLIV. Laboratory Pathology
    XLV. Nephrology
    XLVI. Neurology
    XLVII. Neurological Surgery
    XLVIII. Nuclear Medicine
    XLIX. Obstetrics & Gynaecology
    L. Oncology
    LI. Ophthalmology
    LII. Otorhinolaryngology
    LIII. Orthopaedic Surgery
    LIV. Paediatrics
    LV. Plastic Surgery
    LVI. Psychiatry
    LVII. Pulmonology
    LVIII. Rheumatology
    LIX. Urology

LX. Vascular Surgery.

10. The approximate time that I have practised in my current specialty is [In years]:
    I. 1-5
    II. 6-15
    III. 16-30
    IV. 30 or more.

6. I currently practice primarily in the following Province:
    X. Eastern Cape
    XI. Free State
    XII. Gauteng
    XIII. Kwazulu Natal
    XIV. Limpopo
    XV. Mpumalanga
    XVI. Northern Cape
    XVII. North West
    XVIII. Western Cape.

Please read the following 5 statements carefully and select the option which most truthfully and accurately represents your own personal feeling or point of view:

2. I feel fairly compensated for my work.
– Strongly Disagree
– Disagree
– Agree Somewhat
– Agree
– Strongly Agree.

6. I feel satisfied with my work-life balance.
– Strongly Disagree
– Disagree
– Agree Somewhat
– Agree
– Strongly Agree.

7. My chosen Specialty has lived up to most of my expectations.
– Strongly Disagree
– Disagree
– Agree Somewhat
– Agree
– Strongly Agree.

8. Knowing what I know now, I would choose the same Specialty again.
– Strongly Disagree
– Disagree
– Agree Somewhat
– Agree
– Strongly Agree.

9. **I am satisfied with my life in general.**
   – Strongly Disagree
   – Disagree
   – Agree Somewhat
   – Agree
   – Strongly Agree.

E

Author Guidelines

The *SAMJ* has launched a new submission and tracking system. Authors will be required to register a profile on the Editorial Manager platform in order to submit a manuscript.

To submit a manuscript, please proceed to the *SAMJ* Editorial Manager website:

www.editorialmanager.com/samj

To access and submit an article already in production, please see the guidelines here.

Author Guidelines

Please view the Author Tutorial for guidance on how to submit on Editorial Manager.

Please take the time to familiarise yourself with the policies and processes below. If you still have any questions, please do not hesitate to ask our editorial staff (tel.: +27 (0)21 532 1281, email: submissions@hmpg.co.za).

SAMJ policies

- Types of articles considered by the SAMJ
- Article Processing Charges
- Authorship
- Conflict of interest
- Research ethics committee approval
- Clinical trials
- Protection of patient's rights to privacy
- Copyright notice
- Privacy statement
- Ethnic classification
- CPD

Manuscript preparation

- Preparing an article for anonymous review
- General article format/layout
- Preparation notes by article type
- Illustrations
- Tables
- References

From submission to acceptance

- Submission and peer-review
- Production process
- Changing contact details or authorship

Publication

- Online versus print
- Errata and retractions
- Indexing

SAMJ Policies

Type of articles considered by the SAMJ

The *SAMJ* will no longer limit the articles accepted to those that have 'general medical content', but is intending to capture the spectrum of medical and health sciences, grouped by relevance to the country's burdens of disease. This content will include research in the social sciences and economics that is relevant to the medical issues around our burden of disease. Please see 'A new vision for the *SAMJ* – and a call for papers' for a full discussion of the new directions for the *SAMJ*.

We accept the following types of articles:

Research
Reviews
Clinical trials
Editorials
In Practice (Previously Forum incl. Case Reports)
Correspondence
Obituaries
Book reviews
Ad hoc supplements e.g. guidelines, conference/congress abstracts, Festschrifts*

The following articles are by invitation only:

Guest editorial
Continuing Medical Education (CME)

*Contact claudian@hmpg.co.za for information on submitting ad hoc/commissioned supplements, including guidelines, conference/congress abstracts, Festschrifts, etc.

Publication Fees

All articles published in the *South African Medical Journa*l are open access and freely available online upon publication. This is made possible by applying a business model to offset the costs of peer review management, copyediting, design and production, by charging a publication fee of R5 250 (ex vat) for each research article published. The charge applies only to **Research** articles submitted after 1 March 2017. The publication fee is standard and does not vary based on length, colour, figures, or other elements.

When submitting a Research article to the *SAMJ*, the submitting author must agree to pay the publication fee should the article be accepted for publication. The publicaiton fee is payable when your manuscript is editorially accepted and before production commences for publication. The submitting author will be notified that payment is due and given details on the available methods of payment. Prompt payment is advised; the article will not enter into production until payment is received.
Queries can be directed to claudian@hmpg.co.za.

Please refer to the section on 'Sponsored Supplements' regarding the publication of supplements, where a charge is applicable. Queries can be directed to dianes@hmpg.co.za or claudian@hmpg.co.za

Authorship

Named authors must consent to publication. Authorship should be based on: (*i*) substantial contribution to conceptualisation, design, analysis and interpretation of data; (*ii*) drafting or critical revision of important scientific content; or (*iii*) approval of the version to be published. These conditions must all be met (uniform requirements for manuscripts submitted to biomedical journals; refer to www.icmje.org)

If authors' names are added or deleted after submission of an article, or the order of the names is changed, all authors must agree to this in writing.

Please note that co-authors will be requested to verify their contribution upon submission. Non-verification may lead to delays in the processing of submissions.

Author contributions should be listed/described in the manuscript.

Conflicts of interest

Conflicts of interest can derive from any kind of relationship or association that may influence authors' or reviewers' opinions about the subject matter of a paper. The existence of a conflict – whether actual, perceived or potential – does not preclude publication of an article. However, we aim to ensure that, in such cases, readers have all the information they need to enable them to make an informed assessment about a publication's message and conclusions. We require that both authors and reviewers declare all sources of support for their research, any personal or financial relationships (including honoraria, speaking fees, gifts received, etc) with relevant individuals or organisations connected to the topic of the paper, and any association with a product or subject that may constitute a real, perceived or potential conflict of interest. If you are unsure whether a specific relationship constitutes a conflict, please contact the editorial team for advice. If a conflict remains undisclosed and is later brought to the attention of the editorial team, it will be considered a serious issue prompting an investigation with the possibility of retraction.

Research ethics committee approval

Authors must provide evidence of Research Ethics Committee approval of the research where relevant. Ensure the correct, full ethics committee name and reference number is included in the manuscript.

If the study was carried out using data from provincial healthcare facilities, or required active data collection through facility visits or staff interviews, approval should be sought from the relevant provincial authorities. For South African authors, please refer to the guidelines for submission to the National Health Research Database. Research involving human subjects must be conducted according to the principles outlined in the Declaration of Helsinki. Please refer to the National Department of Health's guideline on Ethics in Health research: principles, processes and structuresto ensure that the appropriate requirements for conducting research have been met, and that the HPCSA's General Ethical Guidelines for Health Researchers have been adhered to.

Clinical trials

As per the recommendations published by the International Committee of Medical Journal Editors (ICMJE), clinical trial research is any research that assigns individuals to an intervention, with or without a concurrent comparison/control group to study the cause-and-effect relationship between the intervention and health outcomes. All clinical trials should be

registered with the appropriate national clinical trial registry (or any international primary register, if relevant), and the trial registration number should be cited at the end of the abstract. All clinical trial reports must also contain a data sharing statement as per the recommendations of the ICMJE. Statements are to indicate:

- whether individual deidentified participant data will be shared;
- what data in particular will be shared; whether additional, related documents will be available;
- when the data will become available and for how long; by what access criteria data will be shared.

Please see the ICJME announcement for further details and illustrative examples of data sharing statements: ICMJE Data Sharing Statements for Clinical Trials

Since 1st December 2005, all clinical trials conducted in South Africa have been required to be registered in the South African National Clinical Trials Register. The SAMJ therefore requires that clinical trials be registered in the relevant public trials registry at or before the time of first patient enrollment as a condition for publication. The trial registry name and registration number must be included in the manuscript.

Please refer to the general guidelines for all papers at the top of this article for additional requirements with respect to ethics approval, funding, author contributions, etc. The format of original research articles should be followed for reporting of clinical trial results.

Patient Consent

Information that would enable identification of individual patients should not be published in written descriptions, photographs, and pedigrees unless the information is essential for scientific purposes and the patient (or parent or guardian) has given informed written consent for publication and distribution. We further recommend that the published article is disseminated not only to the involved researchers but also to the patients/participants from whom the data was drawn. Refer to Protection of Research Participants. The signed consent form should be submitted with the manuscript to enable verification by the editorial team.

Other individuals

Any individual who is identifiable in an image must provide written agreement that the image may be used in that context in the *SAMJ.*

Copyright notice

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Material submitted for publication in the *SAMJ* is accepted provided it has not been published or submitted for publication elsewhere. Please inform the editorial team if the main findings of your paper have been presented at a conference and published in abstract form, to avoid copyright infringement. All research already published as 'Conference proceedings' needs to be substantially re-written, with a new title, a new abstract and new and important results to back up any study before it will be considered for a new publication. The *SAMJ* does not hold itself responsible for statements made by the authors.

Previously published images

If an image/figure has been previously published, permission to reproduce or alter it must be obtained by the authors from the original publisher and the figure legend must give full credit to the original source. This credit should be accompanied by a letter indicating that permission to reproduce the image has been granted to the author/s. This letter should be uploaded as a supplementary file during submission.

Privacy statement

The *SAMJ* is committed to protecting the privacy of its website and submission system users. The names, personal particulars and email addresses entered in the website or submission system will not be made available to third parties without the user's permission or due process. By registering to use the website or submission system, users consent to receive communication from the *SAMJ* or its publisher HMPG on matters relating to the journal or associated publications. Queries with regard to privacy may be directed to publishing@hmpg.co.za.

Ethnic/race classification

Use of racial or ethnicity classifications in research is fraught with problems. If you choose to use a research design that involves classification of participants based on race or ethnicity, or discuss issues with reference to such classifications, please ensure that you include a detailed rationale for doing so, ensure that the categories you describe are carefully defined, and that socioeconomic, cultural and lifestyle variables that may underlie perceived racial disparities are appropriately controlled for. Please also clearly specify whether race or ethnicity is classified as reported by the patient (self-identifying) or as perceived by the investigators. Please note that is not appropriate to use self-reported or investigator-assigned racial or ethnic categories for genetic studies.

Continuing Professional Development (CPD)

SAMJ is an HPCSA-accredited service provider of CPD materials. Principal authors can earn up to 15 CPD continuing education units (CEUs) for publishing an article; co-authors are eligible to earn up to 5 CEUs; and reviewers of articles can earn 3 CEUs. Each month, *SAMJ* also publishes a CPD-accredited questionnaire relating to the academic content of the journal. Successful completion of the questionnaire with a pass rate of 70% will earn the reader 3 CEUs. Administration of our CPD programme is managed by Medical Practice Consulting. To complete questionnaires and obtain certificates, please visit MRP Consulting

Manuscript preparation

Preparing an article for anonymous review

To ensure a fair and unbiased review process, all submissions are to include an anonymised version of the manuscript. The exceptions to this are Correspondence, Book reviews and Obituary submissions.

Submitting a manuscript that needs additional blinding can slow down your review process, so please be sure to follow these simple guidelines as much as possible:

- An anonymous version should not contain any author, affiliation or particular institutional details that will enable identification.

- Please remove title page, acknowledgements, contact details, funding grants to a named person, and any running headers of author names.
- Mask self-citations by referring to your own work in third person.

General article format/layout

Accepted manuscripts that are not in the correct format specified in these guidelines will be returned to the author(s) for correction, which will delay publication.

General:

- Manuscripts must be written in UK English.
- The manuscript must be in Microsoft Word format. Text must be single-spaced, in 12-point Times New Roman font, and contain no unnecessary formatting (such as text in boxes).
- Please make your article concise, even if it is below the word limit.
- Qualifications, ***full*** affiliation (department, school/faculty, institution, city, country) and contact details of ALL authors must be provided in the manuscript and in the online submission process.
- Abbreviations should be spelt out when first used and thereafter used consistently, e.g. 'intravenous (IV)' or 'Department of Health (DoH)'.
- Include sections on Acknowledgements, Conflict of Interest, Author Contributions and Funding sources. If none is applicable, please state 'none'.
- Scientific measurements must be expressed in SI units except: blood pressure (mmHg) and haemoglobin (g/dL).
- Litres is denoted with an uppercase L e.g. 'mL' for millilitres).
- Units should be preceded by a space (except for % and ºC), e.g. '40 kg' and '20 cm' but '50%' and '19ºC'.
- Please be sure to insert proper symbols e.g. µ not u for micro, a not a for alpha, b not B for beta, etc.
- Numbers should be written as grouped per thousand-units, i.e. 4 000, 22 160.
- Quotes should be placed in single quotation marks: i.e. The respondent stated: '...'
- Round brackets (parentheses) should be used, as opposed to square brackets, which are reserved for denoting concentrations or insertions in direct quotes.
- If you wish material to be in a box, simply indicate this in the text. You may use the table format –this is the *only* exception. Please DO NOT use fill, format lines and so on.

SAMJ is a generalist medical journal, therefore for articles covering genetics, it is the responsibility of authors to apply the following:

- Please ensure that all genes are in italics, and proteins/enzymes/hormones are not.

- Ensure that all genes are presented in the correct case e.g. TP53 not Tp53.

**NB: Copyeditors cannot be expected to pick up and correct errors wrt the above, although they will raise queries where concerned.

- Define all genes, proteins and related shorthand terms at first mention, e.g. '188del11' can be glossed as 'an 11 bp deletion at nucleotide 188.'

- Use the latest approved gene or protein symbol as appropriate:

- Human Gene Mapping Workshop (HGMW): genetic notations and symbols
- HUGO Gene Nomenclature Committee: approved gene symbols and nomenclature
- OMIM: Online Mendelian Inheritance in Man (MIM) nomenclature and instructions
- Bennet et al. Standardized human pedigree nomenclature: Update and assessment of the recommendations of the National Society of Genetic Counselors. J Genet Counsel 2008;17:424-433: standard human pedigree nomenclature.

Preparation notes by article type

Research

Guideline word limit: 4 000 words

Research articles describe the background, methods, results and conclusions of an original research study. The article should contain the following sections: introduction, methods, results, discussion and conclusion, and should include a structured abstract (see below). The introduction should be concise – no more than three paragraphs – on the background to the research question, and must include references to other relevant published studies that clearly lay out the rationale for conducting the study. Some common reasons for conducting a study are: to fill a gap in the literature, a logical extension of previous work, or to answer an important clinical question. If other papers related to the same study have been published previously, please make sure to refer to them specifically. Describe the study methods in as much detail as possible so that others would be able to replicate the study should they need to. Results should describe the study sample as well as the findings from the study itself, but all interpretation of findings must be kept in the discussion section, which should consider primary outcomes first before any secondary or tertiary findings or post-hoc analyses. The conclusion should briefly summarise the main message of the paper and provide recommendations for further study.

Select figures and tables for your paper carefully and sparingly. Use only those figures that provided added value to the paper, over and above what is written in the text.

Do not replicate data in tables and in text .

Structured abstract

- This should be 250-400 words, with the following recommended headings:
  - **Background:** why the study is being done and how it relates to other published work.
  - **Objectives:** what the study intends to find out
  - **Methods:** must include study design, number of participants, description of the intervention, primary and secondary outcomes, any specific analyses that were done on the data.
  - **Results:** first sentence must be brief population and sample description; outline the results according to the methods described. Primary outcomes must be described first, even if they are not the most significant findings of the study.
  - **Conclusion:** must be supported by the data, include recommendations for further study/actions.
- Please ensure that the structured abstract is complete, accurate and clear and has been approved by all authors.
- Do not include any references in the abstracts.

Here is an example of a good abstract.

Main article

All articles are to include the following main sections: Introduction/Background, Methods, Results, Discussion, Conclusions.

The following are additional heading or section options that may appear within these:

- Objectives (within Introduction/Background): a clear statement of the main aim of the study and the major hypothesis tested or research question posed
- Design (within Methods): including factors such as prospective, randomisation, blinding, placebo control, case control, crossover, criterion standards for diagnostic tests, etc.
- Setting (within Methods): level of care, e.g. primary, secondary, number of participating centres.
- Participants (instead of patients or subjects; within Methods): numbers entering and completing the study, sex, age and any other biological, behavioural, social or cultural factors (e.g. smoking status, socioeconomic group, educational attainment, co-existing disease indicators, etc)that may have an impact on the study results. Clearly define how participants were enrolled, and describe selection and exclusion criteria.
- Interventions (within Methods): what, how, when and for how long. Typically for randomised controlled trials, crossover trials, and before and after studies.
- Main outcome measures (within Methods): those as planned in the protocol, and those ultimately measured. Explain differences, if any.

Results

- Start with description of the population and sample. Include key characteristics of comparison groups.
- Main results with (for quantitative studies) 95% confidence intervals and, where appropriate, the exact level of statistical significance and the number need to treat/harm. Whenever possible, state absolute rather than relative risks.
- Do not replicate data in tables and in text.
- If presenting mean and standard deviations, specify this clearly. Our house style is to present this as follows:
- E.g.: The mean (SD) birth weight was 2 500 (1 210) g. Do not use the ± symbol for mean (SD).
- Leave interpretation to the Discussion section. The Results section should just report the findings as per the Methods section.

Discussion

Please ensure that the discussion is concise and follows this overall structure – sub-headings are not needed:

- Statement of principal findings
- Strengths and weaknesses of the study
- Contribution to the body of knowledge
- Strengths and weaknesses in relation to other studies
- The meaning of the study – e.g. what this study means to clinicians and policymakers
- Unanswered questions and recommendations for future research

Conclusions

This may be the only section readers look at, therefore write it carefully. Include primary conclusions and their implications, suggesting areas for further research if appropriate. Do not go beyond the data in the article.

Editorials

Guideline word limit: 1 000 words

These opinion or comment articles are usually commissioned but we are happy to consider and peer review unsolicited editorials. Editorials should be accessible and interesting to readers without specialist knowledge of the subject under discussion and should have an element of topicality (why is a comment on this issue relevant now?) There should be a clear message to the piece, supported by evidence.

Please make clear the type of evidence that supports each key statement, e.g.:

- expert opinion
- personal clinical experience
- observational studies
- trials
- systematic reviews.

CME (by invite only)

CME is intended to provide readers with practical, up-to-date information on medical and related matters. It is aimed at those who are not specialists in the field.

From January 2016, all CME articles will be printed in full in the *SAMJ*. Please try to adhere strictly to the guidelines on word count as we have a page limit for the print issue of the *SAMJ*. We reserve the right to place some tables and reference lists online if this is necessary for space.

In practice, this means that each CME topic usually covers two issues of the print issue of the *SAMJ*.

The guest editor, in consultation with the editor, is responsible for convening a team of authors, deciding on the subjects to be covered and for reviewing the manuscripts submitted. The suggestion is for 4 - 5 articles, although there is some room for flexibility contingent on discussions with the editor.

For queries about these guidelines please feel free to contact the CME editor, Dr Bridget Farham, by email (ugqirha@iafrica.com) or telephone (+27 (0)21 789 2331).

Review process

The guest editor reviews the articles and returns them to the CME editor for review and final approval.

Guest editorials

Guideline word limit: 1 000 words

- Include the guest editor's personal details (qualifications, positions, affiliation, e-mail address, and a short personal profile (50words)).
- If possible, include a photograph of the author(s) at high enough resolution for print. It is preferable to provide two guest editorials, one for each issue, so that the content of the articles in each issue is covered.

Articles

Guideline word limit: 2 000 - 3 000 words

- Each article requires an abstract of ±200 words.
- The editor reserves the right to shorten articles but will send a substantially shortened article back for author approval.

Personal details

Please supply: Your qualifications, position and affiliations and MP number (used for CPD points); Address, telephone number and fax number, and your e-mail address; and a short personal profile (50words)and a few words about your current fields of interest.

In Practice

Guideline word limit: 2 000 - 3 000words

This section includes articles that would previously have been accepted into the Forum section, and case reports.

In practice articles are those that draw attention to specific issues of clinical, economic or political interest regarding medicine and healthcare in southern Africa. They are assigned to a topic:

Case report
Clinical practice
Clinical alert
Issues in medicine
Issues in public health
Healthcare delivery
Medicine and the environment
Medicine and the law
Cochrane corner

An In Practice article should follow the following format – sub-headings are not necessary, but may be used for clarity:

- Author affiliations and qualifications: to be the same as for Research. Provide all authors' names and initials, qualifications and full affiliations, and corresponding author.
- Short abstract: does not need to be structured, but should capture the essential features of the article
- Introduction: the reason for the article and the issue being addressed
- Recent research, discussion, local policy around the issue – include your own research where appropriate
- All statements should be referenced and, if opinion only, this should be stated
- Discussion: how this article adds to the discussion around a particular topic
- If a clinical practice or policy point is at issue, this needs to be emphasised, using a box with highlights if appropriate.

Essentially In practice is an opportunity for a more discursive approach to topics of clinical, economic or political importance in southern African health systems. It is not an opportunity to put forward unsubstantiated opinions!

Case reports

The *SAMJ* has recently started to accept case reports. The cases must come from Africa, preferably southern Africa unless the condition is common to all African countries, and must be either a completely new description of a clinical condition or result (use Google!) or a case that highlights important practice or management issues.

Please use the following format for case reports:

- Title of case: do not include the words 'a case report' in the title
- Summary/abstract: up to 150 words summarising the case presentation and outcome
- Background: why is this case important and why did you write it up?
- Case presentation: presenting features, medical, social, family history as appropriate
- Case management: should be according to best practice, and if not, please explain why
- Investigations, if relevant: save space by simply saying 'normal' if, for example, renal function was completely normal, rather than listing normal results, highlight the abnormal – or indeed the normal if this is clinically significant
- Differential diagnosis, if relevant
- Treatment, if relevant
- Outcome and follow-up
- Discussion – a VERY BRIEF review of similar published cases
- Teaching points: 3 - 5 bullet points
- References: as per the *SAMJ* house style
- Tables and figures: keep to a minimum. Use clinical images where relevant – we need hi-res versions for print, and identifiable persons must have a consent form
- Patient consent: please include a statement about patient consent to a written case report. This should be uploaded as a supplementary file.

Clinical trials

Guideline word limit: 4000 words

As per the recommendations published by the International Committee of Medical Journal Editors (ICMJE), clinical trial research is any research that assigns individuals to an intervention, with or without a concurrent comparison/control group to study the cause-and-effect relationship between the intervention and health outcomes. All clinical trials should be registered with the appropriate national clinical trial registry (or any international primary register, if relevant), and the trial registration number should be cited at the end of the abstract. Since 1st December 2005, all clinical trials conducted in South Africa have been required to be registered in the South African National Clinical Trials Register. The *SAMJ* therefore requires that clinical trials be registered in the relevant public trials registry at or before the time of first patient enrollment as a condition for publication. The trial registry name and registration number must be included in the manuscript.

Please refer to the general guidelines for all papers at the top of this article for additional requirements with respect to ethics approval, funding, author contributions, etc. The format of original research articles should be followed for reporting of clinical trial results.

Review articles

Guideline word limit: 4 000 words

These are welcome, but should be either commissioned or discussed with the Editor before submission. A review article should provide a clear, up-to-date account of the topic and be aimed at non-specialist hospital doctors and general practitioners.

Please ensure that your article includes:

- Abstract: unstructured, of about 100-150 words, explaining the review and why it is important
- Methods: Outline the sources and selection methods, including search strategy and keywords used for identifying references from online bibliographic databases. Discuss the quality of evidence.
- When writing: clarify the evidence you used for key statements and the strength of the evidence. Do not present statements or opinions without such evidence, or if you have to, say that there is little or no evidence and that this is opinion. Avoid specialist jargon and abbreviations, and provide advice specific to southern Africa.
- Personal details: Please supply your qualifications, position and affiliations and MP number (used for CPD points); address, telephone number and fax number, and your e-mail address; and a short personal profile (50 words) and a few words about your current fields of interest.

Correspondence (Letters to the Editor)

Guideline word limit: 500 words

Letters to the editor should relate either to a paper or article published by the SAMJ or to a topical issue of particular relevance to the journal's readership

- May include only one illustration or table
- Must include a correspondence address.

Book reviews

Guideline word limit: 400 words

Should be about 400 words and must be accompanied by the publication details of the book. Provide a hi-res image of the cover if possible (with permission from the copyright holder).

Obituaries

Guideline word limit: 400 words

Should be offered within the first year of the practitioner's death, and may be accompanied by a photograph.

Guidelines

Guidelines should always be discussed with the Editor prior to submission.

Because of the intensive review process required to ensure Guidelines are independent, evidence-based and free from commercial bias, they are usually published as a supplement to the *SAMJ*, the costs of which must be covered by sponsorship, advertising or payment by the guideline authors/association. We will provide a quote based on the expected length of the guideline and whether it is to appear online only, or in print, which must be accepted by the body putting the guidelines together before submitting the work to the SAMJ.

The Editor reserves the right to determine the scheduling of supplements. Understandably, a delay in publication must be anticipated dependent upon editorial workflow.

All guidelines should include a clear, transparent statement about all sources of funding and an explicit, clear statement of conflicts of interest of any of the participants in the guidelines about industry funding for lectures, research, conference participation etc.

All guidelines should be structured according to Agree II.

Please access this website before putting the guidelines together, download the Agree 11 instrument and use this to put the guidelines together.

All submitted guidelines will be sent to the local Agree II appraisal committee for review and must be endorsed by an appropriate body prior to consideration and all conflicts of interest expressed.

A structured abstract not exceeding 400 words (recommended sub-headings: *Background, Recommendations, Conclusion*) is required. Sections and sub-sections must be numbered consecutively (e.g. 1. Introduction; 1.1 Definitions; 2.etc.) and summarised in a Table of Contents.

Illustrations/photos/scans

- If illustrations submitted have been published elsewhere, the author(s) should provide consent to republication obtained from the copyright holder.
- Figures must be numbered in Arabic numerals and referred to in the text e.g. '(Fig. 1)'.
- Each figure must have a caption/legend: Fig. 1. Description (any abbreviations in full).
- All images must be of high enough resolution/quality for print.
- All illustrations (graphs, diagrams, charts, etc.) must be in PDF or jpeg form.
- Ensure all graph axes are labelled appropriately, with a heading/description and units (as necessary) indicated. Do not include decimal places if not necessary e.g. 0; 1.0; 2.0; 3.0; 4.0 etc.
- Scans/photos showing a specific feature e.g. *Intermediate magnification micrograph of a low malignant potential (LMP) mucinous ovarian tumour. (H&E stain).* –include an arrow to show the tumour.
- Each image must be attached individually as a 'supplementary file' upon submission (not solely embedded in the accompanying manuscript) and named Fig. 1, Fig. 2, etc.

Tables

- Tables should be constructed carefully and simply for intelligible data representation. Unnecessarily complicated tables are strongly discouraged.
- Large tables will generally not be accepted for publication in their entirety. Please consider shortening and using the text to highlight specific important sections, or offer a large table as an addendum to the publication, but available in full on request from the author
- Embed/include each table in the manuscript Word file - do not provide separately as supplementary files.
- Number each table in Arabic numerals (Table 1, Table 2, etc.) and refer to consecutively in the text.
- Tables must be cell-based (i.e. not constructed with text boxes or tabs) and editable.
- Ensure each table has a concise title and column headings, and include units where necessary.
- Footnotes must be indicated with consecutive use of the following symbols: * † ‡ § ¶ || then ** †† ‡‡ etc.

Do not: Use [Enter] within a row to make 'new rows':

Rather:

Each row of data must have its own proper row:

Do not: use separate columns for *n* and %:

Rather:
Combine into one column, *n* (%):

Do not: have overlapping categories, e.g.:

Rather:
Use <> symbols or numbers that don't overlap:

References

NB: *Only complete, correctly formatted reference lists in Vancouver style will be accepted. Reference lists must be generated manually and not with the use of reference manager software. Endnotes must* ***not*** *be used.*

- Authors must verify references from original sources.
- Citations should be inserted in the text as superscript numbers between square brackets, e.g. These regulations are endorsed by the World Health Organization,[2] and others.[3,4-6]
- All references should be listed at the end of the article in numerical order of appearance in the Vancouver style (not alphabetical order).
- Approved abbreviations of journal titles must be used; see the List of Journals in Index Medicus.
- Names and initials of all authors should be given; if there are more than six authors, the first three names should be given followed by et al.
- Volume and issue numbers should be given.
- First and last page, in full, should be given e.g.: 1215-1217 **not** 1215-17.
- Wherever possible, references must be accompanied by a digital object identifier (DOI) link). Authors are encouraged to use the DOI lookup service offered by CrossRef:
  - On the Crossref homepage, paste the article title into the 'Metadata search' box.
  - Look for the correct, matching article in the list of results.
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  - Provide as follows, e.g.: https://doi.org/10.7196/07294.937.98x

Some examples:

- *Journal references:* Price NC, Jacobs NN, Roberts DA, et al. Importance of asking about glaucoma. Stat Med 1998;289(1):350-355. http://dx.doi.org/10.1000/hgjr.182
- *Book references:* Jeffcoate N. Principles of Gynaecology. 4th ed. London: Butterworth, 1975:96-101.
- *Chapter/section in a book:* Weinstein L, Swartz MN. Pathogenic Properties of Invading Microorganisms. In: Sodeman WA, Sodeman WA, eds. Pathologic Physiology: Mechanisms of Disease. Philadelphia: WB Saunders, 1974:457-472.
- *Internet references:* World Health Organization. The World Health Report 2002 - Reducing Risks, Promoting Healthy Life. Geneva: WHO, 2002. http://www.who.int/whr/2002 (accessed 16 January 2010).
- Legal references

  - Government Gazettes:

  National Department of Health, South Africa. National Policy for Health Act, 1990 (Act No. 116 of 1990). Free primary health care services. Government Gazette No. 17507:1514. 1996.

  In this example, 17507 is the Gazette Number. This is followed by :1514 - this is the notice number in this Gazette.

- Provincial Gazettes:

Gauteng Province, South Africa; Department of Agriculture, Conservation, Environment and Land Affairs. Publication of the Gauteng health care waste management draft regulations. Gauteng Provincial Gazette No. 373:3003, 2003.

- Acts:

South Africa. National Health Act No. 61 of 2003.

- Regulations to an Act:

South Africa. National Health Act of 2003. Regulations: Rendering of clinical forensic medicine services. Government Gazette No. 35099, 2012. (Published under Government Notice R176).

- Bills:

South Africa. Traditional Health Practitioners Bill, No. B66B-2003, 2006.

- Green/white papers:

South Africa. Department of Health Green Paper: National Health Insurance in South Africa. 2011.

- Case law:

Rex v Jopp and Another 1949 (4) SA 11 (N)

Rex v Jopp and Another: Name of the parties concerned

1949: Date of decision (or when the case was heard)

(4): Volume number

SA: SA Law Reports

11: Page or section number

(N): In this case Natal - where the case was heard. Similarly, (C) woud indicate Cape, (G) Gauteng, and so on.

NOTE: no . after the v

- *Other references (e.g. reports) should follow the same format:* Author(s). Title. Publisher place: Publisher name, year; pages.
- Cited manuscripts that have been accepted but not yet published can be included as references followed by '(in press)'.
- Unpublished observations and personal communications in the text must **not** appear in the reference list. The full name of the source person must be provided for personal communications e.g. '...(Prof. Michael Jones, personal communication)'.

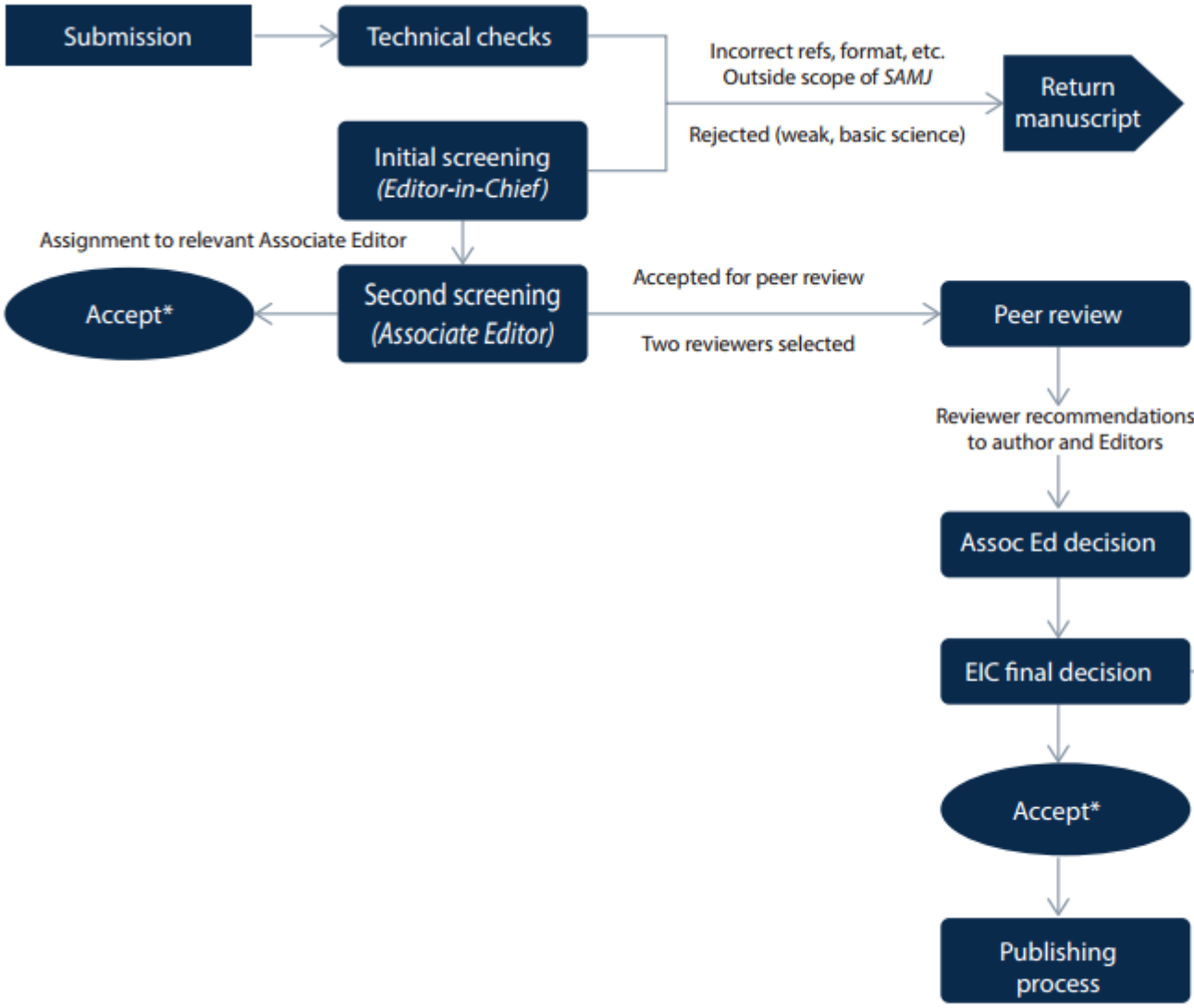
From submission to acceptance

Submission and peer-review

To submit an article:

- Please ensure that you have prepared your manuscript in line with the SAMJ requirements.
- All submissions should be submitted via Editorial Manager
- The following are required for your submission to be complete:
  - Anonymous manuscript (unless otherwise stated)
  - Manuscript
  - Any supplementary files: figures, datasets, patient consent form, permissions for published images, etc.
- Once the submission has been successfully processed on Editorial Manager, it will undergo a technical check by the Editorial Office before it will be assigned to an editor who will handle the review process. If the author guidelines have not been appropriately followed, the manuscript may be sent back to the author for correcting.

Peer-review process



*Manuscripts accepted at this point are limited to Editorials, Correspondence, Obituaries, Book reviews, Abstracts, CME
**Some minor revisions may be requested

Production process

Please note that there is a 6-month waiting time for publication, once an article has been sent to the production team.

The following process will follow:

1. An accepted manuscript is passed to a Managing Editor to assign to a copyeditor (CE).
2. The CE copyedits in Word, working on house style, format, spelling/grammar/punctuation, sense and consistency, and preparation for typesetting.

3. If the CE has an author queries, he/she will contact the corresponding author and send them the copyedited Word doc, asking them to solve the queries by means of track changes or comment boxes.
4. The authors are typically asked to respond within 1-3 days. Any comments/changes must be clearly indicated e.g. by means of track changes. Do not work in the original manuscript - work in the copyedited file sent to you and make your changes clear.
5. The CE will finalise the article and then it will be typeset.
6. Once typeset, the CE will send a PDF of the file to the authors to complete their final check, while simultaneously sending to the 2nd-eye proofreader.
7. The authors are typically asked to complete their final check and sign-off within 1-2 days. No major additional changes can be accommodated at this point.
8. The CE implements the authors' and proofreader's mark-ups, finalises the file, and prepares it for the upcoming issue.

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Online

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- Citation information of each article is based on its online publication.
- You may want to make use of the advantages of online publication e.g. specify web links to other sources, images, data or even a short video.

Print

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- Research articles will appear *in abstract form only*, if selected for a print edition.

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We will investigate the issue and provide feedback. If appropriate, we will correct the web version immediately, and will publish anerratum in the next issue. The correction will be indexed, as PubMed has a function for linking errata back to the original article. All investigations will be conducted in accordance with guidelines provided by the Committee on Publication Ethics (COPE).

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Contact claudian@hmpg.co.za for information on submitting ad hoc/commissioned supplements, including guidelines, conference/congress abstracts, Festschrifts, etc.

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As part of the submission process, authors are required to check off their submission's compliance with all of the following items, and submissions may be returned to authors that do not adhere to these guidelines.

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3. The text complies with the stylistic and bibliographic requirements in **Author Guidelines**.
4. The manuscript is in Microsoft Word document format. The text is single-spaced, in 12-point Times New Roman font, and contains no unnecessary formatting.
5. Illustrations/figures are high resolution/quality (not compressed) and in an acceptable format (PDF or jpeg). These must be submitted individually as 'supplementary files' (not solely embedded in the manuscript).
6. For illustrations/figures or tables that have been published elsewhere, the author has obtained written consent to republication from the copyright holder.
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8. An abstract has been included where applicable.
9. The research was approved by a Research Ethics Committee (if applicable)
10. Any conflict of interest (or competing interests) is indicated by the author(s).

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