



© Bundeswehr/Meike Reetz

## REVIEW

## The problem of “individual operational readiness”: facts and options

Dieter Leyk<sup>a, b</sup>

### Summary

Today more than ever, the Bundeswehr as a modern, mission-oriented force depends on personnel that is physically and psychologically resilient, mission-capable and ready for operations. In view of society-wide negative health and performance trends, demographic change, and challenging operational demands, maintaining and improving individual operational readiness becomes increasingly important. This review is based on 1.) a selective literature-research, 2.) analyses of >30,000 medical check-ups to assess the individual medical aptitude for participation in compulsory yearly testing of individual basic capabilities and physical performance (IGF/KLF) and 3.) analyses of Basic-Fitness-Test (BFT) participation rates (N > 350,000) from 2012 to 2016.

The results are thought-provoking: Only 75 % of middle-aged soldiers are – from a medical perspective – sufficiently fit to participate in tests of individual basic military capabilities (shooting with the individual standard firearm, NBC- and medical training), and of physical performance (Basic-Fitness-Test, 15 kg ruck-march, and swimming). The mean percentage of individuals who successfully passed the BFT in the 5-year-timeframe from 2012–2016 was 39.7 % on average. In light of these negative developments, it is increasingly urgent that all personnel refocus on individual operational readiness as a personal objective. One option is the implementation of a system of incentives to enhance individual operational readiness. Such systems are successful and ubiquitous in our society.

**Keywords:** health, performance, fitness, prevention, systems of incentives

### Introduction

Individual operational readiness is one prerequisite for mission success. It will gain considerable importance with regards to the safeguarding of international deployments, and the imminent refocus on allied and national defense. However, negative health- and performance trends in society have an increasing impact on soldiers and their individual operational readiness. In this narrative review, the underlying causes of this development as well as available facts concerning individual operational readiness are reported. To conclude, options for enhancing individual operational readiness are presented.

### Negative society-wide trends in health and performance

Digitalization has profoundly changed working life, leisure time behavior, and people's attitudes. Permanent sitting on the job, while commuting, and in leisure time, paired with unhealthy eating habits have led to a deterioration of health, resilience, and physical performance in the general population [8, 9, 18, 21, 24, 27, 30, 41]. The growing health problems are exemplified by the number of sick days, which has risen by 70 % (+ 227 M. absence days) in Germany in the period from 2008 to 2017 [7]. Not only the lack of physical exercise, but also the cross-generational excessive use of digital media has considerable health-related consequences (concentration problems, adverse effects on working memory and fluid intelligence, sleeping disorders, mental problems, etc.) [16, 38, 42]. The incidence of depressive symptoms

<sup>a</sup> Bundeswehr Institute for Preventive Medicine, Andernach

<sup>b</sup> Research Group Epidemiology of Performance, German Sport University Cologne

and burnout syndroms has been increasing for years, indicating that for many, personal stress limits are being exceeded and resilience is decreasing [6, 28].

The decrease of performance and resilience, occurring in virtually all age groups, progressively affects the military domain and is becoming an ever-increasing problem in many armed forces [1, 14, 19, 23, 29, 32, 34, 35, 40]. As early as 20212, a NATO Research-Task-Group (Impact of Lifestyle and Health Status on Military Fitness) spent 3 years developing recommended courses of action [33].

### Indicators for individual operational readiness in the Bundeswehr

Is the individual operational readiness of soldiers still sufficient in light of these negative trends? As there is no quantitative definition of "sufficient individual operational readiness", an answer to this important question can presently only be derived from suitable indicators such as parameters of health status and physical performance capabilities.

#### Health status

The "General Check-up for Aptitude – Individual Basic Capabilities" (AVU-IGF) has been introduced into the Bundeswehr on January 1st 2019. It is the mandatory, tri-annual check-up for medical aptitude prior to participation in the compulsory and annual tests for physical performance and individual basic capabilities (IGF/KLF) [5]. Individual basic capabilities (IGF) tests include shooting, NBC-training and medical training [4]. The "physical performance" tests (KLF) include a 6 km ruck-march with 15 kg load, the Basic-Fitness-Test (BFT), and swimming [4].

It is important to note that AVU-IGF is not a performance test but a medical examination. Hence, an AVU-IGF result of "suitable" merely indicates that the health requirements are met for participation in IGF/ KLF training and testing. It is thus not possible to derive an assessment of general operational readiness from the AVU-IGF result. In the first half of the 3-year cycle (January 1st, 2019–June 30, 2020), 83.6 % of all evaluated personnel have been classified as "suitable", i.e. deemed medically fit to participate in all IGF/ KLF-tests. Figure 1 shows marked differences between age groups: While more than 90 % of personnel in the younger age groups are allowed to participate in IGF/KLF testing, the percentage of individuals without health limitations notably decreases with middle age. There are no medical concerns against participation in IGF/ KLF testing for 75 % of 40 to 49-years-olds and for less than 40 % of older individuals.

Differences between age groups are also obvious in single IGF/KLF-disciplines. Figures 2 and 3, for example, show the percentages of individuals classified as "permanently not suitable" for marching (Figure 2) and shooting (Figure 3).

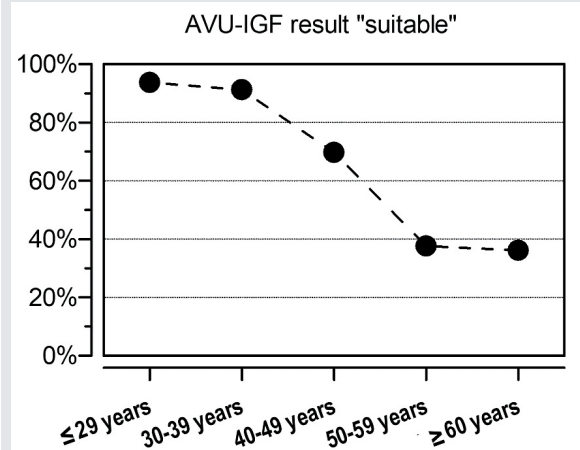


Figure 1: Percentages of individuals with the evaluation result "suitable" (= no medical concerns regarding compulsory IGF/KLF testing), stratified by age groups. (n = 25,581).

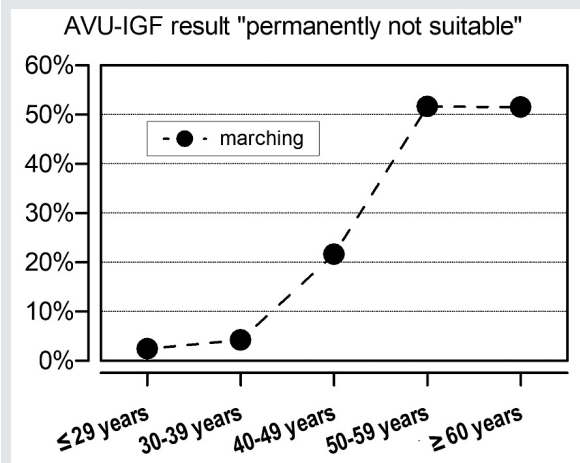


Figure 2: Percentages of individuals with the evaluation result "permanently not suitable" for marching (n = 3,291); for these individuals, permanent health limitations preclude participation in the yearly tests.

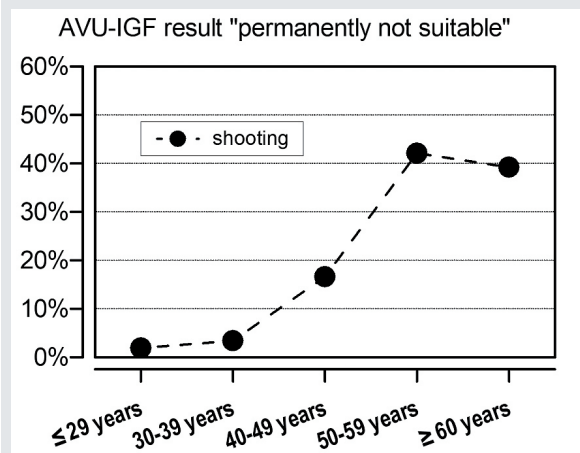


Figure 3: Percentages of individuals with the evaluation result "permanently not suitable" for shooting (n = 2,606); for these individuals, permanent health limitations preclude participation in the yearly tests.

Already in middle age, increasing numbers of individuals are not allowed to participate even in tests for the military core tasks marching and shooting. Among the over-50-year-old soldiers, more than 50 % (marching) and more than 40 % (shooting), respectively are classified as “permanently not suitable”.

For the first time, and impressively so, the valuable and worthwhile AVU-IGF examinations verify the growing number of soldiers showing health limitations with increasing age.

**Physical Performance**

Individual physical performance cannot be inferred from the AVU-IGF result “suitable“. It can, however, be measured by using the Basic-Fitness-Test (BFT), which comprises an 11 x 10-metre-sprint test, flexed arm hang and 1000-metre-run. The BFT is an evaluated performance diagnostics tool, introduced force-wide in 2010. Annual BFT participation is mandatory for all personnel, according to instruction of the Inspector General [3, 12, 22, 25]. For the purpose of this review, the range of BFT-performances is not analyzed in-depth. Instead, the focus is on the number of successfully completed BFTs.

It is astonishing that, in light of the great importance of individual operational readiness and the fundamental obligation for annual BFT participation, data of successful BFT participation for the 5-year period from 2012–2016 is only available for 39.7 % (on average) of all personnel. Reasons for the low success rate are not passing the minimum BFT standards (< 1 %), non-analysable data sets (20–30 %), and non-participation (health reasons, exemption by disciplinary superiors, and unknown reasons). Figure 5 shows age-associated, successful BFT-participations from the year 2015, when the highest percentage of completed BFTs was obtained (see Figure 4). Again, the differences between age groups are obvious. Whereas in the 3rd decade of life, at least almost 60 % of soldiers successfully complete the BFT, the rate drops with increasing age. Reported participation rates are below 20 % and below 10 % for 50 to 59-year-olds and for over-60-year-olds, respectively.

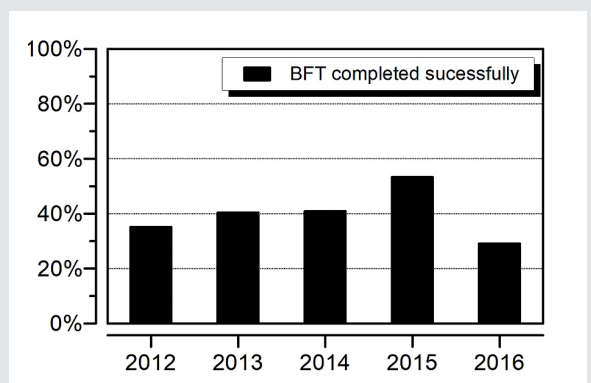


Figure 4: Percentages of soldiers with the BFT-result “passed” in the period from 2012 to 2016 (n = 361,479)

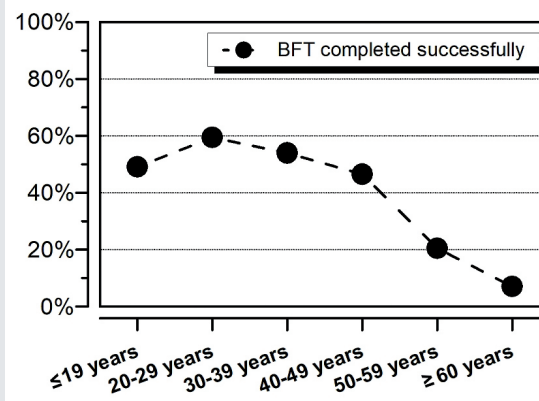


Figure 5: Percentages of soldiers with the BFT-result “passed” in the year 2015 stratified by age groups (n = 94,414)

The results of the AVU-IGF examinations conducted and analyzed hitherto as well as the BFT data indicate that resilience and performance of many Bundeswehr personnel need to be improved. With regards to operational readiness and mission planning, it must be assumed that the percentage of soldiers who are physically fit and “mission ready“ decreases significantly as age increases.

**Negative trends despite mandatory physical training and Corporate Health Management**

These negative developments are especially worrisome because the Bundeswehr already provides its personnel with excellent options for maintaining and enhancing physical and mental health: Dedicated time for physical training and Corporate Health Management (CHM). Soldiers are obligated to complete at least four 45-minute physical training sessions per week [4]. This does not only serve performance maintenance and -enhancement, but is also intended to strengthen individual health maintenance and a sense of community. Beyond that, all personnel are offered the opportunity to voluntarily participate in various CHM activities twice per week for 60 min per session. These range from physical activity- and nutrition programmes aimed at different target groups to courses on stress management and smoking cessation.

It is obvious that the current combination of mandatory training and voluntary CHM participation is nevertheless insufficient to fully compensate the negative trends in health and physical performance.

**Changes in work attitude and workplace conditions**

Within the complex field of “individual operational readiness“, it must be taken into consideration that workplace conditions and the attitudes of people towards professional work requirements have recently undergone marked changes and will continue to change in the future. Many fields of work are now shaped by work intensification, personnel shortages, overtime and growing time

pressure. This frequently leads to stress, higher error rates, decreasing job satisfaction and health problems (e.g. sleeping disorders, tinnitus, burnout) [2, 10, 15, 20, 26, 37]. Private matters, personal wellbeing, leisure time, the compatibility of family and work life as well as larger scopes for decision-making have become a higher priority, especially for younger generations; influencing their attitude towards work demands [11, 17, 39]. For instance, "Deutsches Ärzteblatt" reports on the generational conflict of hospital physicians which has been smouldering for years (SCHMEDT 2020 – front-page topic of the issue from February 14th, 2020 [36]. Similarly, the demands of young soldiers towards the Bundeswehr as an employer have considerably increased in the past years. [31].

### Incentive systems for improving individual operational readiness

It will be a huge challenge for the Bundeswehr to obtain the largest possible number of operation-ready and high-performing soldiers. One powerful option for the improvement of individual operational readiness are incentive systems [13, 20].

Incentive systems are widespread, and successful in civil society (e.g. bonus programmes in retail and health insurance, behavior-dependent insurance rebates, work performance premiums). The Bundeswehr also uses incentives (e.g. mission medals, oversea allowances, performance premiums, hardship allowances, duty- and adjustment bonuses, best prices, medals/crosses of honour, performance badges, or the weapons proficiency badge).

In the context of operational readiness, the question arises whether soldiers also have reasons **not to be ready for operation**: separation from family and social environment, danger to life and limb, operational hardships, less free time, 7-day-week. Such "incentives" may work against the intended goal. Against this backdrop and in light of the negative trends described above, it is important to motivate as many Bundeswehr personnel as possible to rethink and turn operational readiness into a personal goal [19, 20].

This could be achieved by means of a time-limited incentive instrument (e.g. termed "Fit-for-Mission") which could, for example, offer various benefits for a period of three years after a commitment to personal operational readiness has been made and the respective certificates have been supplied (medial fitness, IGF/KLF certificates, language certificates etc.). Possible incentive elements could be (i) individual appreciation (e.g. mission badge "Fit-for-Mission", personal awards), (ii) material advantages (operational readiness bonus, career advantages), and (iii) incentives regarding leisure time or improved compatibility of family and work life (special leave, credit towards special pension age limits or towards retirement age).

Besides improving individual operational readiness, an incentive system "Fit-for-Mission" could lead to a stronger focus on the mindset in the Bundeswehr towards military operations. Faced with negative health and performance trends, demographic change and high operational demands, the question is less whether incentive systems for the improvement of operational readiness are needed, but rather about how they can be designed to be effective [13].

### References

1. Baygi F, Hertzua K, Jensen OC et al.: Global prevalence of cardiometabolic risk factors in the military population: a systematic review and meta-analysis. *BMC Endocr Disord* 2020; 20(1): 8.
2. Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (ed.): Öffentlicher Dienst: hohe Arbeitsintensität, starke Belastung. Dortmund, Berlin, Dresden: BAuA 2020.
3. Bundesministerium der Verteidigung: Zentralvorschrift A1-221/0-24 „Ausbildung und Erhalt der Individuellen Grundfertigkeiten“. 3. Änderung vom 25. April 2018.
4. Bundesministerium der Verteidigung: Zentralvorschrift A1-224/0-1 „Sport und Körperliche Leistungsfähigkeit“. 2. Änderung vom 2. November 2017.
5. Bundesministerium der Verteidigung: Zentralvorschrift A1-831/0-4007 „Allgemeine Verwendungsfähigkeitsuntersuchung auf Individuelle Grundfertigkeiten (AVU-IGF)". (Version 1 vom 8. November 2018)
6. Derks D, Bakker AB: Smartphone use, work-home interference, and burnout: A diary study on the role of recovery. *Appl Psychol* 2014; 63(3): 411-440.
7. Deutsches Ärzteblatt: Zahl der Krankheitstage deutlich gestiegen. *Dtsch ArzteBl* 2019; <<https://www.aerzteblatt.de/nachrichten/106881/Zahl-der-Krankheitstage-deutlich-gestiegen>>, last access January 21st, 2021.
8. Ekblom-Bak E, Ekblom Ö, Andersson G et al.: Decline in cardiorespiratory fitness in the Swedish working force between 1995 and 2017. *Scand J Med Sci Sports* 2019; 29(2): 232-239.
9. Fischer B, Sedlmeier AM, Hartwig S et al.: Anthropometrische Messungen in der NAKO Gesundheitsstudie – mehr als nur Größe und Gewicht. *Bundesgesundheitsblatt* 2020; 63(3): 290-300.
10. Friedl KE, Breivik TJ, Carter R3 et al.: Soldier health habits and the metabolically optimized brain. *Mil Med* 2016; 181(11): e1499-e1507.
11. Fuchs P, Herzog Y: Generation Z - Die neue Herausforderung in der Rekrutierung von Talenten und Fachkräften. Bachelor Thesis. Basel: Fachhochschule Nordwestschweiz/Hochschule für Wirtschaft 2018.
12. Gorges W, Rütter T, Hauptert M, Holtherm HU, Leyk D: Fünf Jahre Basis-Fitness-Test: Erkenntnisse und Optimierungsmöglichkeiten. *WMM* 2015; 59(12): 390-395.
13. Hackfort D: Vor- und Nachteile von Anreizsystemen aus psychologischer Sicht. *WMM* 2020; 64(8): 277-278.
14. Hruby A, Hill OT, Bulathsinhala L et al.: Trends in overweight and obesity in soldiers entering the US Army, 1989-2012. *Obesity* 2015; 23(3): 662-670.
15. Hünefeld L: Zeitdruck und Co - Wird Arbeiten immer intensiver und belastender? *BauA* 2019; <<https://www.baua.de/DE/Angebote/Publikationen/Fakten/BIBB-BAuA-26.html>>, last Access January 25, 2021.
16. Junghanns G, Kersten N: Informationsüberflutung am Arbeitsplatz. *Zbl Arbeitsmed* 2019; 69(3): 119-132.
17. Klaffke M: Millennials und Generation Z – Charakteristika der nachrückenden Arbeitnehmer-Generationen. In: Klaffke M (ed.) *Generationen-Management: Konzepte, Instrumente, Good-Practice-Ansätze*. Wiesbaden: Springer Gabler 2014; 57–82.
18. Kluttig A, Zschocke J, Haerting J et al.: Messung der körperlichen Fitness in der NAKO Gesundheitsstudie – Methoden, Qualitätssicherung und erste deskriptive Ergebnisse. *Bundesgesundheitsblatt* 2020; 63(3): 312-321.
19. Leyk D, Franke E, Hofmann M et al.: Gesundheits- und Fitnessförderung in der Bundeswehr. Von ressourcenorientierter Präven-

- tionsforschung zur Umsetzung in die Fläche. WMM 2013; 57(7): 162-166.
20. Leyk D, Harbaum T, Schoeps S: Warum bleiben Menschen gesund und leistungsfähig. Ein wichtiger Forschungsbereich des künftigen Institutes für Präventivmedizin der Bundeswehr. Wehrmed Wehrpharm 2016; 16(4): 93-94.
  21. Leyk D, Helmhout PH: Epidemic of sedentary lifestyle: Evolution and implications. In: NATO (ed.): RTO-TR-HFM-178: Impact of lifestyle and health status on military fitness. Final Report of Task Group HFM-178. Neuilly-Sur-Seine Cedex 2012; 1.1.-1.12.
  22. Leyk D, Rohde U: Valide Erfassung und Dokumentation der körperlichen Fitness – Voraussetzung zur Neukonzeption von Grundausbildung und Einsatzvorbereitung. WMM 2018; 62(10): 372-373.
  23. Leyk D, Rohde U, Harbaum T, Schoeps S: Körperliche Anforderungen in militärischen Verwendungen: Votum für ein „Fitness-Register Ausbildung und Einsatz“. WMM 2018; 62(1-2): 2-6
  24. Leyk D, Rüter T, Wunderlich M et al.: Physical performance in middle age and old age. Good news for our sedentary and aging society. Dtsch Arztebl Int 2010; 107(46): 809-816.
  25. Leyk D, Witzki A, Gorges W et al.: Körperliche Leistungsfähigkeit, Körpermaße und Risikofaktoren von 18-35-jährigen Soldaten: Ergebnisse der Evaluierungsstudie zum Basis-Fitness-Test (BFT). WMM 2010; 54(11-12): 278-282.
  26. Lück M, Hünefeld L, Brenscheidt S, Bödefeld M, Hünefeld A: Grundauswertung der BIBB/BAuA-Erwerbstätigenbefragung 2018 (Forschung Projekt F 2417). BauA 2019; <<https://www.baua.de/DE/Angebote/Publikationen/Berichte/F2417.html>>, last access January 25, 2021.
  27. Mensink GBM, Schienkiewitz A, Haftenberger M et al.: Übergewicht und Adipositas in Deutschland: Ergebnisse der Studie zur Gesundheit Erwachsener in Deutschland (DEGS1). Bundesgesundheitsblatt 2013; 56(5-6): 786-794.
  28. Meyer M, Maisuradze M, Schenkel A: Krankheitsbedingte Fehlzeiten in der deutschen Wirtschaft im Jahr 2018 – Überblick. In: Badura B, Ducki A, Schröder H, Klose J, Meyer M (eds.): Fehlzeiten-Report 2019: Digitalisierung - gesundes Arbeiten ermöglichen. Berlin, Heidelberg: Springer Verlag 2019; 413-477.
  29. Military Medicine (ed.): Total force fitness for the 21st century. A new paradigm. Mil Med 2010; 175 (Supplement 8).
  30. NCD Risk Factor Collaboration: Worldwide trends in body-mass index, underweight, overweight, and obesity from 1975 to 2016: a pooled analysis of 2416 population-based measurement studies in 128-9 million children, adolescents, and adults. Lancet 2017; 390(10113): 2627-2642.
  31. NATO (ed.): RTO-TR-HFM-178: Impact of lifestyle and health status on military fitness. Final Report of Task Group HFM-178. Neuilly-Sur-Seine Cedex. NATO (2012)
  32. Persikowski L: Zielsetzung und Rahmenbedingungen militärischer Ausbildung am Beispiel der Offiziersausbildung im Heer. WMM 2018; 62(10): 356-357.
  33. Reyes-Guzman CM, Bray RM, Forman-Hoffman VL, Williams J: Overweight and obesity trends among active duty military personnel: a 13-year perspective. Am J Prev Med 2015; 48(2): 145-153.
  34. Santtila M, Pihlainen K, Koski H, Ojanen T, Kyröläinen H: Physical fitness and body anthropometrics profiles of the female Recruits entering to voluntary military service. Mil Med 2019; 184(1-2): e200-e205.
  35. Santtila M, Pihlainen K, Koski H, Vasankari T, Kyröläinen H: Physical Fitness in Young Men between 1975 and 2015 with a Focus on the Years 2005-2015. Med Sci Sports Exerc 2018; 50(2): 292-298.
  36. Schmedt M: Generationen im Krankenhaus - Der Wandel ist nicht zu stoppen. Dtsch Arztebl 2020; 117(7): A308-A310.
  37. Stevanin S, Palese A, Bressan V, Vehviläinen-Julkunen K, Kvist T: Workplace-related generational characteristics of nurses: A mixed-method systematic review. J Adv Nurs 2018; 74(6): 1245-1263.
  38. Stothart C, Mitchum A, Yehner C: The attentional cost of receiving a cell phone notification. J Exp Psychol Hum Percept Perform 2015; 41(4): 893-897.
  39. Talmon GA: Generation Z: What's next? Med Sci Educ 2019; 29(Supplement 1): 9-11.
  40. U. S. Army Public Health Center: 2019 Health of the force report. Aberdeen: APHC 2020.
  41. Vaara JP, Santtila M, Vasankari T et al.: Cardiorespiratory and muscular fitness in young adult Finnish men between 2003 and 2015. Scand J Med Sci Sports 2020; 30(4): 716-724.
  42. Vahedi Z, Saiphoo A: The association between smartphone use, stress, and anxiety: A meta-analytic review. Stress Health 2018; 34(3): 347-358.

**Manuscript Data**

Submitted: May 10, 2020  
 After Revision accepted: July 8th, 2020  
 Update: Januar 25, 2021

**Citation**

Leyk D: The problem of "individual operational readiness": facts and options. WMM 2021; 65(3): 122-126.

**For the Authors**

Colonel (MC) Prof. Dr. Dr. Dieter Leyk  
 Bundeswehr Institute for Preventive Medicine  
 Aktienstrasse 87, D-56626 Andernach  
 E-Mail: dieterleyk@bundeswehr.org