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ASSESSMENT OF THE NASA RESEARCH PROGRAM RESEARCH PORTFOLIO

Abstract

The NASA Human Research Program (HRP) started in 2004 and developed a risk reduction strategy to “buy down” the biomedical risks for humans participating in exploration space missions. The goal was to use applied biomedical research and technology development to prevent or mitigate potential health problems both during the mission and then post mission lifetime health of astronaut. The list of potential risks were derived from current evidence and health data obtained from the general population and from people who work in extreme environments or in high-risk professions. Appropriate research questions than were prioritized and research was competitively solicited from research institutions, government agencies and industry. The research provides new information and the evidence base is continually updated leading to 1) new questions for additional research, 2) ways to mitigate the established risks by monitoring, prevention, treatment and rehabilitation, 3) the development of new or improved biomedical technologies that could be used during space missions, 4) data that is used to improve and set new health standards by the Chief Health Medical Officer, and 5) obtain information for NASA engineers to improve spacecraft and environmental design, and function for biomedical safety for the astronauts crewing the space missions. The research assessed the comparison between pre 2004 research and post 2005 research to determine how the research differed and if the HRP strategy improved the research “deliverables” enumerated above. NASA medical operations have identified over 100 spaceflight medical conditions and spaceflight induced physiologic changes. There are 34 HRP risks currently being “worked”, 28 which are part of the list of spaceflight medical conditions. HRP risks are due to 1) altered gravity field, 2) radiation, 3) travel-distance from earth, 4) relative isolation, and 5) hostile-closed environment spacecraft design. NASA funded 1217 biomedical research proposals between 1995 and 2018; 270, pre-HRP applied research (1995-2003) and 947, HRP proposals (2004-2018). Pre-HRP investigators - 7The HRP is significantly accomplishing its mission by increasing research deliverables for the NASA exploration program.